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Slums, Sanitation, and Mortality in the Roman World

In recent years a great deal has been written about life expectancy and mortality in the Roman empire, but very little has been said about the possible or probable causes of what by contemporary western standards must be regarded as a very low average life expectancy at birth of c. 25 years, an estimate which now appears to be generally accepted by many classicists. It is true that some writers hint that low levels of sanitation and poor standards of public health at Rome and in other large cities in the Roman empire are in some way to blame for a high mortality rate. Friel, for example, refers in passing to "fetid metropolises", but leaves his readers to imagine the details for themselves.

The aim of this paper, then, is to try to estimate, as accurately as available evidence permits, how sanitary or insanitary Roman towns were. Particular attention will be paid to fundamental inadequacies in various types of Roman housing, deficiencies in the disposal of human and animal wastes, and legal shortcomings which virtually ensured that large numbers of destitute and near-destitute inhabitants of Rome lived in squalid conditions which were well known to high-status Romans, but which were ignored by successive imperial administrations.


Above n. 1, 259.
Despite the shortcomings of Roman urban hygiene which emerge when comparisons are made with standards of public health in modern western industrialized societies, it must be said that the Romans achieved a remarkable level of standardization in the provision of certain basic facilities such as public latrines and baths. These, as will be seen, had some serious deficiencies, but credit should be given to the Romans for some degree of progress in the sphere of public hygiene. References to hygiene-crateria established by modern authorities have been included in this paper mainly because of a lack of critical Roman evidence in this field. The modern criteria referred to in this paper serve primarily to provide the discussion with a structural framework. They are not intended to give a negative aspect to Roman achievement, though negative inferences will sometimes inevitably arise.

The difficulties involved in such an undertaking are not to be underestimated. Archaeologists rarely concern themselves with either latrines or sewers. Hence the extent of the underground sewer-networks of Pompeii, Ostia, and Rome are still very imperfectly known. Nor is the current lack of archaeological reporting in this area counterbalanced by a sufficiency of evidence in ancient literary sources. Vitruvius has much to say about such subjects as salubrious sites for villas and the purity of domestic water supplies, but he has virtually nothing to say about the disposal of human and other wastes in houses or cities. Perhaps decorum precluded discussion.

4 By far the most comprehensive study of all aspects of hygiene at Pompeii (ventilation, water supply, drains, latrines, etc.) is by H. Mygind, Sanitats Verhältnisse im alten Pompeji, in: Jahrbuch 25 (1921), 251–281, 365–324, 363–383, a study which has not received the attention it deserves (hereafter cited as Mygind). On p. 276 Mygind says the underground sewer network is insufficiently known, a remark repeated by H. Eschebach, Pompeii — Straßenbau der Antike, in: Antike Welt 9 (1978), 10; cf. also Mygind’s Die Wasserversorgung Pompeji, in: Jahrbuch 21 (1947), 294–351 and Eschebach’s Die Gebrauchswasserversorgung des antiken Pompeji, in: Antike Welt 10 (1979), 3–24.

5 R. Meiggs, Roman Ostia, Oxford 1973, 586 (hereafter Meiggs). Both Pompeii and Rome are situated on sloping sites; a circumstance which enabled engineers to construct street drains with a steep fall, discharging in the case of Pompeii into the Sarno, in the case of Rome into the Tiber (though, as will be seen, the Cloaca Maxima did back up in its lower stretches near the river, see p. 413 below). By contrast Ostia was built on a comparatively level site with a high water-table which made it relatively easy for engineers to construct water wheels to supplement with ground water aqueduct supplies which were inadequate for the full needs of the thermae (Meiggs 144). This combination of a level site with a high water table possibly resulted in drains becoming water-logged. For example the main sewer of the Baths of Mithras “is filled with water and is perhaps still connected with the Tiber”; cf. also Meiggs 144.

6 Brief discussion by R. Lanciani, Ancient Rome in the Light of Recent Discoveries, Boston 1889, 49–73; E. Jordan, Topographie der Stadt Rom im Alterthum I. 1, Berlin 1871 (repr. Rome 1970), 441–451; although parts of the Cloaca Maxima have been sporadically captured (see S. B. Fideler — T. Ashby, A Topographical Dictionary of Ancient Rome, Oxford 1929, 198f.) the fabric of the entire collector with all its tributaries has never been systematically studied. The start of such a project was announced by S. Pieczczek, L’Esplorazione della Cloaca Massima, in: Capitulum 50 (1975), 2–10.

7 For a somewhat perfunctory discussion, see A. Böllner, Die hygienischen Anschauungen des römischen Architekten Vitruvius, Jena 1913.

8 At i. i. 10 Vitruvius says architects must be acquainted with cursus... elucorum, but neither here nor elsewhere in his handbook does he enumerate these cursus.
d such topics, and it is possible that presumed knowledge of normal practice made such a discussion unnecessary. It is to be remembered that Vitruvius was writing for aristocratic patrons, and not for public health engineers.

Modern scholarly literature on Roman urban sanitation is also limited in scope and accuracy. The standard works of Pöhlmann,10 Lanciani,11 Jordan,12 Friedländer,13 Homo,14 Carcopino,15 and others,16 provide valuable overviews of the topography, town-plan, and administration of the city of Rome, and also give a general picture of the life-styles of the different sectors of Roman society, but are deficient in the area of public hygiene.

I "Slums"

The enormous gulf which separated advantaged from disadvantaged in the Roman empire with respect to access to the legal system, medical care, and education, is also very evident in the case of housing which was taken to be an index of a person's social status.17 At the top of the Roman housing scale were the conspicuously lavish imperial palaces such as the short-lived Domus Aurea and the long lived "Palatium" of Domitian which provided this and all subsequent emperors in the Western empire with 40,000 m² of secure, comfortable, living space, and which virtually monopolized Rome's most prestigious hill. Next came senatorial residences such as that of Scaurus, the charms of which are described by one of his noisier occupants: "The delights of the rural life in the city. As Frier has recently shown, many members of this class rented censulae in insulae on long term leases. The apartments, subdivided into rooms with individual specific functions, would be situated on the lower floors of insulae. By contrast the upper floors of these houses housed lower-status Romans in subdivided, undifferentiated cellae rented probably on a daily basis. The poor also lived in tabernae which in design ranged from single roomed shop/dwellings to larger complexes consisting of

11 Above n. 6. 441-480 for drains and water supply.
16 For status symbols among the Romans, see F. Kolb, Zur Stattensymbolik im antiken Rom, in: Chiron 7 [1977], 239-260.
a shop with one or two living rooms at the rear with or without mezzanines.20 The very poor might also hire rooms in cheap boarding houses21 where rent was probably paid daily. The destitute (egens) suffered the rigours of a wide range of improvised shelter: shanties pieced together from the detritus of the more fortunate (tuguria22, erasteria23) which must have been similar to the improvised slums in slums which skirt the capitals of many developing countries.24 Several ancient sources refer to huts erected against or on top of public buildings, or between the columns of porticoes in front of shops. Such structures were likely to be demolished from time to time by city officials.25 The destitute also found refuge in tombs26 which also served on occasion

20 Four main types are distinguished by G. Girri, La taberna nel quadro urbanistico e sociale di Ostia, Rome 1956, 6ff, whereas only two are recognised at Rome by R. A. Stacciol, Le tabernae a Roma attraverso la Forma Urbis, in: Rend. Linc. 14 [1959], 58; B. W. F. Leigh, The Rental Market in Early Imperial Rome, in: JRS 67 [1977], 30 n. 20 accepts that c. 91–95 % of the population of Ostia lived in shops or small flats, or slept in the streets; cf. also J. E. Packer, Middle and Lower Class Housing in Pompeii and Herculaneum, in: B. Andreæ — H. Kyrielis (eds.), Neue Forschungen in Pompeji, Essen 1974, 141.

21 Componae, deversoria, hospitia, stabularia were all “rooming houses” where inmates could eat and sleep. J. E. Packer, Inns at Pompeii: A Short Survey, in: Cronache Pompeiane 4 [1978], 5–35; Hermandsen (above n. 15) 125–203. Both these studies improve on the standard work by T. Kleberg, Hôtels, restaurants et cabarets dans l’antiquité romaine, Uppsala 1957. Ulpian (Dig. 47. 5. 1. 6) proves the existence of permanent residents in componae and stabula.

22 According to Pomponius, Dig. 50. 16. 180, tuguria originally denoted a shack erected in the country for the guarding of crops, and was not associated with town dwellings. In Costa Rica tugurio = slum; R. Biesanz, The Costa Ricans, Englewood Cliffs 1982, 74. Cf. Vitruvius 2. 1. 4–5 for descriptions of various types of tuguria and casae found in different parts of the Roman world; Alciphrion 1. 1. 2; 2. 27. 1; Apuleius, Met. 4. 12; 9. 32; Strabo 4. 4. 3; Pausanias 10. 4. 1; for the thatched huts of agricultural workers in N. Africa (mapaila), see R. Laporte, L’Habitat rural d’époque romaine en Maurétanie tingitane, in: Rivista Storica dell’Antichità 4 [1974], 173ff.; R. G. Goodchild, in: FBRS 19 [1951], 53, 55; also depicted on a mosaic in the Bardo Museum; T. Corneli — J. Matthews, Atlas of the Roman World, London 1982, 118. According to Seneca, Ep. 18. 7; 100. 6 the rich included in their residences pasuerum celias where they fleetingly practised austerity. On the so-called tuguria Funerale (casae Romuli, see A. Alföldi, Die Struktur des vorrömischen Römerstaates, Heidelberg 1974, 117.


24 See for example D. J. Dwyer, Asian Urbanization, A Hong Kong Casebook, Hong Kong 1971, 88–110 (The Apichau Squatter Area).

25 B. MacMullen, Roman Imperial Building in the Provinces, in: HSCP 64 [1959], 206f. (slum clearances): Dio Chrysostom, Or. 40. 8–9; John Chrys. In I Cor. 11. 5 (PG 61, 94f.) on which see A. González Blanco, Economia y sociedad en el bajo imperio según S. J. Catoétomo, Madrid 1980, 329; Ulpian, Dig. 43. 8. 2. 17 indicating that if an unofficial building did not obstruct a public place, it might be allowed to stand and yield land-tax (sodalism): Cod. Theod. 15. 1. 39 states that “loam-toe” (parasperata) attached to public or private buildings are to be torn down, if the neighbourhood feared they might become a fire risk or be a source of invidia; but cf. 15. 1. 4 which permits the erection of shelters above public workshops. For squatting against aqueducts, see O. Robinson, The Water Supply of Rome, in: Studia et Documenta Historiae et Dissertationes 46 [1980], 72.

26 Ulpian, Dig. 47. 12. 3; 47. 12. 3. 11 refers specifically to slaves living in tombs. Those of the rich often took the form of small houses; K. Hopkins, Death and Renewal, Cambridge 1983, 205f., 247–255; W. F. Jashemski, The Gardens of Pompeii, New York 1979, 141–168; Meiggs 455–476.
as improvised brothels and lavatories. Others slept in spaces under the stairs of insulae (subarcaria), in underground cellars (crypta), vaults (fornices), or in the open air. To what extent public baths were used by the poor for shelter is impossible to estimate. The very low admission fee at Rome of 1/4 ass would admit all but the poorest, but since so little is known about the administration of the baths at night, it is difficult to estimate how many people might have tried to sleep in them at night, especially during wintertime. This brief list of types of urban accommodation may be concluded by mentioning unicellular barracks-room units which were standard for legionaries, vigilae, gladiators, and low-status prostitutes.

Hence the term *hustaria meochea,* Martial 3. 93. 15.

Trimalchio fears that people will soil his tomb with excrement; Petronius Satyr. 71. 8.

"The *subarcaria* in Ostia show heavy use": G. Hermansen, The Population of Imperial Rome: The Regionaries, in: Historia 27 (1978), 166f.; the latrines of ground floor *cenacula* were often situated close to or under the *subarcaria*; Hermansen (above n. 15) 29; J. E. Packer, in: Bulletino Commissioni 81 (1988/1989), 147 n. 61; Harsh, in: MAAR 12 (1955), 23 & fig. 7; dogs were sometimes housed in this area; C. Giordano — G. V. Pelagalli, Cane e canili nella antica Pompei, in: Accademia Pontaniana, Atti 7 (1967), 199.

Föhlin (above n. 9) 90—98.

Föhlin (above n. 9) classifies *crypta* together with *fornice* as „Kellerwohnungen“, but the references he cites (97 n. 9), e.g., Juvenal 10. 238 *cancer fornices;* 11. 174 *sidus fornices,* do not necessarily imply that the vaults are underground. It is likely that in these cases *fornix = cellae meretricioa,* a cubicule in a *lupanar.* Ulpi, Dig. 43. 17. 3. 7 refers to underground rooms.

Frier (above n. 20) 30 n. 20.

SHA, Rev. Alex. 24. 6 explicitly says *thermae* were open at night; SHA, Tac. 10. 2 refers to the closing of the baths at night in the reign of Tacitus, because they were regarded as a source of *sedicio.* Cod. Just. 8. 12. 19 and Cod. Theod. 15. 1. 32 provide evidence for the use of the baths at night. E. Brödner, Die römischen Thermen und das antike Badewesen, Darmstadt 1983 offers no useful comment and merely remarks without documentation that bath facilities were suspended „nur einige Stunden während der Nacht“ (119). Two economic considerations would seem to have militated against the use of public baths at night: Firstly the cost of providing oil for lighting, secondly the cost of providing additional fuel for the furnaces which would be damped down at night, but not allowed to go out, since it took a considerable length of time to achieve the required temperatures when the heating system was initially cold. Pliny sent unexpected, or short-term guests at his Laurentine villa to the public baths of a nearby *vicus* rather than heat up the baths at his villa (Ep. 2. 17. 25). Baths with unglazed windows such as the Forum Baths at Ostia would be unsuitable for night use; E. D. Thatcher, The Tombe del Foro at Ostia, in: MAAR 24 (1956), 200.


B. Birley, Vindolanda, London 1977, 47; average dimensions of each room: 12 x 18 ft.; "the same floor space British architects gave to the families of native soldiers in India before World War II.


Pompeii: J. Overbeck — A. Mau, Pompeji, Leipzig 1884, 195; no traces of beds were found in the *cellae* when excavated; it is assumed the gladiators slept on straw; G. Ville, La gladiature en Occident, Paris 1981, 298—301 assumes the inmates slept 1 or 2 to a room c. 10—15 m². At the Ludus Magnus at Rome the *cellae* have average dimensions of c. 20 m² (300); see further A. Hönle — A. Henze, Römische Amphitheater und Stadien, Zürich 1981, 141.

P. Guzman, Pompeii, London 1900, 226—228; *cellae* in the brothel at the junction of
It is not unusual for classicists to claim that Rome’s urban poor lived in “slums”, but those who use this term do not define the word or specify its implications. It might be useful, therefore, to consider modern criteria and definitions of sub-standard accommodation and then apply these to the ancient evidence. P. Townsend in his massive study of poverty in the U. K. isolates the following traditionally accepted indices of “poor”, “unfit”, or “slum” housing:

1. Structural defects (leaking roofs, damp walls, brickwork, ill-fitting doors and windows, etc.)
2. Inadequate housing facilities (lack of piped water, toilets, washing facilities, etc.)
3. Inadequate space, overcrowding (no more than two people to one room).

II Ruins

The structural shortcomings of Rome’s insulae which according to the Regionaries outnumbered domus by a ratio of c. 30:1, are widely attested in late Republican and imperial literature. Poor building materials, inadequate preparation of foundations, and inexpert or careless workmanship seem often to have resulted in structural collapse, a fate which was also feared though probably not so frequently experienced by the occupants of domus. As in other large cities in the Roman world, such as Carthage and Antioch, the rich at Rome tended to site their houses on the ridges or slopes of hills which were well ventilated, drained, and sunny, whereas the poor the via del Balcone and via del Luponare measure c. 6 × 6 ft.; in some streets, according to Guzman, single cellae meretriciae “open directly into the street, having no communication with the houses in which they are embedded”. It is to be assumed that such rooms were rented from the owners of the houses concerned: I. Bloch, Die Prostitution vol. 1, Berlin 1912, 325ff.; M. della Corte, Case ed abitanti di Pompei, Rome 1924, 49, 134ff., 141, 198.


101 The Regionaries give a total of c. 46,000 insulae for Rome, a figure Hermansen amends to c. 25,000 (above n. 28, 167). II. rightly criticises those who have uncritically accepted the statistics of the Regionaries.


103 Sen. Ep. 90.43, contrasting the luxury of contemporary Roman houses with the dwellings of primitive man: at vis ad omnem tectorum pavetis sonum et inter picturas ventris, et quid increpatis, fugiatis attonitis, non habebant domos inest urbium ... haec erat secundum naturam domus, in qua libebrabilitatem nec ipsam nec pro ipsa litemen: nunc magnas para nostri mutas tota sunt.

104 A. Lézine, Sur la population des villes africaines, in: Antiquités africaines 3 (1969), 74 who states (70) that there is no proof of the existence of insulae in Roman Carthage, or at any other site in precolonial Africa; Strabo 16. 2. 23 claims houses at Tyre had more storeys than insulae at Rome. For tower-blocks at Motya, see J. I. S. Whitaker, Motya, London 1921, 22, 86.

105 Liebeschütz (above n. 23) 51.
lived in the valleys between the hills, or in the areas close to the Tiber. When the river overflowed, as it frequently did, swirling flood-water might sear out and undermine foundations, or mud brick walls might become saturated and collapse.

Vitruvius "an expert [who] bears testimony to the excellent construction of insulae" explicitly refers to lege publicae (2.3.17) which prohibited the building of party walls more than 1½' thick, and observes that other walls (ceteri parietes) were kept to the same breadth to maximize internal living space. This passage is instructive, since it not only explains one possible cause of structural collapse due to the inadequacy of load-bearing walls on the lower floors of apartment blocks, but also reveals the somewhat lackadaisical attitude of Roman officials towards the establishment of responsible and effective building codes. A law which lays down the maximum width of party walls, but which ignores the minimum thickness of freestanding, load-bearing external walls, is clearly likely to be open to abuse by speculators keen to save money on materials and increase rental revenues by letting the greatest available floor space to the largest possible number of tenants. Under such conditions overcrowding might become a contributing cause of structural failure.

Other Roman building laws give the impression of evincing some concern for the structural safety of insulae. The most important is the height restriction of 70 Roman feet established by Augustus. Yet subsequent reiteration of this and the few other laws affecting the maintenance of dwellings suggests that they were largely ignored by property owners. The state lacked the machinery to enforce the observance of its rudimentary building regulations, and poverty-stricken inquilini would be reluctant to prosecute delinquent landlords who regarded the collapse of rental properties with complete indifference for the fates of their tenants.

40 After the building of the Domus Flavia on the Palatine, the rich moved to the Caesian, Aventine, and Quirinal hills. The Pincian was also noted for its sumptuous villas and horti. The poor were crowded into low-lying, inner-city areas: the Subura, Argiletum and Velabrum. Transpontimum, the Janiculum excepted, was a poor district; Lavedan (above n. 15) 323; Homo (above n. 13) 477-488; J. P. Frier, The Septizonium and the Subura, in: TAPA 108 (1978), 147-154; J. C. Anderson, Domitian, the Argiletum and the Temple of Peace, in: AJA 86 (1982), 101-103.

41 For a list of the main inundations, see G. Lugli, Monumenti antichi di Roma e suburbio vol. 2, Bardi 1934, 231f.

42 Dio 39.81.1-2 gives such an account during a flood in B. C. 54.


44 For the meagre corpus of Roman building laws, see Yavetz, in: Latomus 17 (1958), 512f.; Frier (above n. 20) 36.

"Overcrowding is one reason why houses frequently fall down" (sc. in Cairo): The Economist, Dec. 25, 1982, p. 54.

45 This limit was evidently determined without proper considerations for the height of the buildings in relation to the width of the streets. In this case the result would be in many cases unsatisfactory ventilation and insufficient light at street level: Le rapport H: L [hauteur: largeur] ... choquera évidement tout urbaniste moderne; Lavedan (above n. 15) 481.

46 Cf. the frequent repetition of the prohibition against unroofing, dismantling, or demolishing urban dwellings suspected cases. The provision is found in the town charters of Terentum, Urcu, and Malace; Homo (above n. 13) 537-544; F. Haverfield, Ancient Town Planning, Oxford 1913, 137-139.


48 Cicero, Ad Att. 14.9.1; inquilini could abandon a building without risk of prosecution
and political resources requisite for redress, the plebs urbana must have considered the risk of ruina as much a part of life in the capital as the dangers of fire and flood. All available evidence about accommodation at Rome reveals a massive degree of indifference on the part of the state towards the housing needs of its indigent masses. A reflection of this indifference comes from the statement of Gaius in the Digest (50, 16. 234. 2) that subsistence was thought to refer only to food, though others considered it also comprised clothing and straw, sine his enim vivere neminem posse. From this it is clear that shelter was not considered an essential part of the legal concept of subsistence in the Roman world.

However, it must not be assumed that all insulae at Rome were structurally unsound. Such an assumption would be as false as a belief based on Vitruvius’ claim that insulae were comfortably housed and had agreeable views of the city, a reflection surely of the architect’s will to flatter Augustus rather than a statement of his personal views of residential tower blocks at Rome.

Packer’s thorough study of the only “almost intact” insula at Rome, the Casa di via Giulio Romano, suggests that all the inhabitants of this Trajanic building, from its ground floor shops to its fourth floor cubicles, must have experienced a wide range of discomforts and anxieties frequently alluded to by Martial and Juvenal; but a fear of ruina is not likely to have been one of them, since this insula was built of brick-faced concrete, and concrete vaults are in evidence on all of its surviving floors. In this respect, then, the building does not conform to the satirical stereotype depicted by Juvenal in Sat. 3. 190ff. As the building backs directly on to and abuts the living rock of the Capitoline, it gained extra stability, though in this case the benefit of additional support was offset by the seepage of moisture through the rear walls which were not fitted with double walls or tegulae mammatae. On the fourth floor the rear access corridor would have acted as a protective damp course, but such an arrangement is not found on the other floors. It is also noteworthy that the building measures c. 22 m. from its base to the top of its highest surviving floor thus exceeding both the Augustan and the Trajanic height limits (20.65 m and 17.70 m respectively). At

by a landlord for loss of rent, if their fears of ruina were justifiable; see Frier (above n. 18) 99f.

See Thompson, On Development and Underdevelopment (above n. 2) 300ff.


The Hortulanus in Apuleius, Met. 9. 31 lives below even this level of subsistence: prae nihia pauvertate ne sibi quidem, sedum mihi possent stranam aliquod vel eiquum tegimen porare; according to Sallust, Cat. 48. 2. the plebs had nothing beyond their food and clothing; G. E. M. de Ste Croix, The Class Struggle in the Ancient Greek World, London 1961. 372.

2. 8. 17.


Ibid. 147 n. 54.

The outer walls on the ground floor are c. 3 Roman feet thick, reducing to c. 2' (or less) on the fourth. The masonry dividing walls, c. 0.36 m thick, rest on vaulted ceilings; Harsh, MAAR 12 [1935], 26 n. 4, 28 n. 2. Frier (above n. 18) 14 dates the building to c. A. D. 100.

Vitruvius’ solution of a double wall (7. 4. 1–2) is nowhere found at Pompeii (Mygind 298); on tegulae mammatae, see G. Brodribb, Tegulae Mammatae, in: Antiquaries Journal 59 [1979], 400.

Packer (above n. 59) 131 fig. 2.
least 2 more metres may be added to the already given total height, since it is likely that there was another floor above the highest surviving level.64

The Ostian evidence shows that insulae there were generally of an adequate structural soundness, but it is also acknowledged that conclusions made about housing at Ostia should not be uncritically applied to Rome65 which was larger, more congested, and even after the fire of A.D. 64, did not undergo the type of radical redevelopment experienced at Ostia in the reigns of Claudius, Trajan, and Hadrian. Despite the structural soundness of the via Giulia Romano insula, the persistence of an unfavourable literary tradition about Roman insulae from Cicero to the end of the empire, strongly suggests that jerry-built multiple dwellings were the norm at Rome, even though they appear to have been the exception at Ostia. It must be remembered, however, that because Roman architects were incapable of exactly calculating the strains and stresses in any given structure (just as Roman engineers could not measure velocity) structural soundness could not be guaranteed even for the most expensive and prestigious buildings. Thus the basilica of Domitian's palace required considerable buttressing not long after its construction,66 as did the main vaulted room in the Casa dei Triclini (I. xii. 1) at Ostia.67

III Sanitation

Townsend's second broad indicator of substandard accommodation ("inadequate housing facilities") will be examined in relation to evidence for sanitation and hygiene in Roman houses and cities. To help in distinguishing adequate from inadequate sanitation (i.e., the disposal of human and other wastes), it would be helpful to refer to some basic modern criteria. These are succinctly given by Salvato:68

"The improper disposal of human excreta and sewage is one of the major factors threatening the health and comfort of individuals in areas where satisfactory sewage systems are not available. This is so because very large numbers of different disease producing organisms can be found in the fecal discharges of ill and apparently healthy persons ... Knowing that organisms causing various types of diarrhea, bacillary dysentery, infectious hepatitis, salmonella infection, and many other illnesses are found in excreta, it becomes obvious that all sewage should be considered presumptively contaminated, beyond any reasonable doubt, with disease producing organisms ... Therefore, the mere exposure of sewage, or its improper disposal, immediately sets the stage for possible disease transmission ... Sewage is satisfactorily disposed of when 1) It will not be accessible to children or household pets, pollute the surface of the ground, or be exposed to the atmosphere when inadequately treated. 2) It will not contaminate any drinking water supply. 3) It will not give rise to a public health hazard by being accessible to insects, rodents, pets, or other possible mechanical carriers that may come in contact with food or drinking water. 4) It will not give

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64 Harash (above n. 61) 20 n. 4.
65 J. E. Packer, The Insulae of Imperial Ostia, Rome 1971, 76; Meiggs, Trees and Timber (above n. 39) 239.
66 MacDonald (above n. 17) 60.
67 Harash (above n. 61) 23.
68 J. A. Salvato, Environmental Sanitation, New York 1959, 186.
rise to a nuisance due to odor or unsightly appearance. 5) It will not pollute or contaminate the waters of any bathing beach, shell-fish breeding ground, or stream used for public, domestic water supply, or recreational purposes. 6) It will not violate laws or regulations governing water pollution or sewage disposal.

Literary evidence concerning sewers and latrines in the Roman world is extremely meagre. Vitruvius, as already noted (p. 400f. ) maintains a discreet silence. Frontinus merely observes that the overflow (aqua caduca/otiosa) of Rome's fountains (salientes) and public basins (lacus) flushed the city's sewers.69 Agricultural writers make brief references to the use of human excrement as a supplement to animal fertilizers.70 There are a few other references to the cleansing of sewers by convict labour,71 and to those who profited from running public latrines (foricae),72 to the fullers' terracotta jars placed in the streets for the public to use as urinals,73 and to Vespasian's tax on urine.74 However, though some of these brief allusions75 are useful, there is nowhere extant a description of either a public or private Roman latrine, and no account of their administration.

Legal texts are also exiguous. The lex Julia municipalis (66f.) (CIL, 12. 593) states that plostra stercoris76 exponiandae causae were permitted to enter Rome during the daytime when most wheeled traffic was prohibited. Ulpian (Dig. 43. 23. 1-2) reports a praetor's edict which states that sewers were to be kept clean and in a good state of repair quorum utrumque et ad salubritatem civitatem et ad plateas pertinet: nam et coacium pestilenz77 et ruinam minantur immunitas locorum (43. 23. 1. 2). While it is easy to understand that clogged sewers will create a fetid atmosphere, it is not immediately evident why they would be likely to cause the collapse of buildings.78 However, a major blockage in a large collector such as the Cloaca Maxima which in winter must have conducted large volumes of marsh and storm water into the Tiber, could have caused floods with consequent scouring out of foundations and the dissolving of mud-brick structures.

The edict also distinguishes between public sewers maintained by the state, and private sewers the upkeep of which was the responsibility of individual property owners who according to Dig. 43. 23. 1. 9 had the right to connect a private to a public

69 Columella 10. 84f.; 11. 3. 12.
70 Pliny, Ep. 10. 32. 2.
71 Juvenal 3. 38.
72 Martial 6. 93. 1; Macrob., Sat. 3. 16. 15.
73 Suet., Vesp. 23. 3.
74 These are collected and very briefly discussed by Thédenat in his article "Latrina" in Daremberg-Saglio 3. 2, 887-891.
75 M. G. Morgan, Gladiola and Metellus, in: Athenaeum 52 (1974), 318 n. 19 shows that contrary to Pohlmann and Friedländer [=Drexl], stercus here does not necessarily mean "refuse" rather than "excrement". E. G. Hardy, Roman Laws and Charters, Oxford 1912, 153 opts for "refuse"; Homo (above n. 13) 256 has it both ways: cordures et débris variés.
76 Cf. Pliny, Ep. 10. 98 and 99 (Trajan's reply) on an open sewer (a river clogged with sewage) at Amastris.
77 Pliny, NH 36. 24. 106 boasts that Rome's sewers were so well constructed that they were not damaged by buildings which collapsed of their own accord or through fire (pulsant ruinæ sporis præcipitatis et impactae incendio).
never without hindrance, on receiving permission from the curatores viarum publicorum
(Dig. 43. 23. 2).

It seems, then, that there was no legal obligation for a home-owner to connect his
dwelling to a public street sewer. Such a connection was optional, and it seems that
the owner had to meet all the expenses resulting from such an operation. Extant
Roman law is silent on the question of where domestic latrines were to be situated
and how they were to be constructed. The Romans were legally more concerned about
the intramural burial of the dead than they were about the disposal of human and
animal wastes within the city, though, as will be seen, corpses seem to have been
dumped within the city.

Currently available archaeological evidence from Pompeii, Ostia, and Rome
indicates that very few dwellings were directly connected to street drains. Lanciani
reports of his own excavations at Rome: “In the many hundred of antique drains
discovered...I have never seen a sign of communication with the houses lining the
streets through which the drains passed.” At Pompeii almost every house had a drain
which conducted excess water from the impluvium or peristyle to the surface of the
street; less frequently these drains also conducted dirty water from kitchens on to
the streets. With one exception (VII. viii. 28), drains leading directly from a latrine
into the street were not found by Mygind, and only exceptionally did he find in private
houses latrines connected to sewers. In some cases the connections were crudely
improvized as in VII. iv. 7 where a large hole in the floor of the shop leads directly
into the cloaca of the via dell’Abbondanza.

On the other hand, almost every house at Pompeii had a latrine situated either in
or partly separated from the kitchen, or in a separate, very small, doorless room,
usually unlit and lacking adequate ventilation through an outside window. None of
these latrines, with the possible exception of a large latrine in the House of the Silver
Wedding, was flushed by water. All consisted of pits (sterquilinia) of varying depths
dug into the porous lava-mass directly beneath or not far from the latrine itself. The
porous rock allowed fluids to drain away, but solids would periodically have to be
evacuated from the cesspit, if the latrine was to remain in use.

Mygind assumes that both kitchen-latrines and cesspits in separate small rooms
were celiae familiarices, used only by household staff, whereas domini and their

79 M. J. Le Gall, La sépulture des pauvres à Rome, in: Bulletin de la Société National des
80 Above n. 10, 31; confirmed by Platner—Ashby, A Topographical Dictionary (above n. 6)
127; misrepresented by F. H. Garrison, The History of Drainage, Irrigation, Sewage-
(1929), 844 where it is said cesspits from iusulae were piped into sewers. At Mohenjo-
Daro (Indus valley) almost every house had a bathroom and a water flushed latrine con-
ected to a sanitary sewer system; C. Webster, The Sewers of M.-J., in: Journal of the
Water Pollution Control Federation (hereafter JWPCF) 34 (1962), 118f.; for general
(esp. p. 28).
81 Mygind 268f.
82 W. F. Jashemski, in: AJA 81 (1977), 217f. and n. 5 notes that wastes from upstairs rooms
at I. xx. 5 emptied into a sewer under the via Nuceria.
83 Mygind 275.
84 Mygind 309, 314, 315f.
85 Mygind 318f.
guests employed a variety of portable receptacles (matellae, lasana, sellae portuenses) which slaves would eventually empty into the house latrine. This cannot be accepted as anything more than an assumption, since it appears to depend on a passage in Petronius where Trimalchio grants his table companions the opportunity to relieve themselves in his dining room (Satyr. 47. 5). However, an examination of the full context strongly suggests that Trimalchio authorizes his guests only to urinate, not defecate in the tridinium: vel si quid plus venit, omnia foras parata sunt: aqua, lasani et cetera minuatio.

Trimalchio’s familia includes slaves one of whose tasks is to handle matellae. At the very opening of the Cena Petronius portrays Trimalchio playing a ball game which he does not interrupt when a eunuch applies a silver chamberpot to him (Satyr. 27. 3 and 5). After relieving himself, he asks for water, sprinkles it on his hands, and then wipes his fingers on the hair of another slave, presumably a capillatus. Since the narrator introduces these events as novelties (res notae), it is difficult to know whether Trimalchio’s behaviour would have been regarded as socially acceptable. It is quite possible that the novelty of the situation is not that a eunuch is serving his master with a silver matella, but that he is performing this service outside while Trimalchio is engaged in a game.

Yet whatever the interpretation placed on the above passage, it hardly constitutes proof that high-status Romans did not use latrines in their own houses. Trimalchio’s words omnia foras parata sunt are best taken to refer to a domestic latrine.

It hardly requires emphasis that such practices were extremely unhygienic. Internal cesspits even when emptied at regular intervals, would be constant sources of major infections and offensive smells. To site a cesspit in a kitchen would have the practical advantage of enabling cooks to dispose of kitchen fluids and garbage without physical inconvenience, but the risk of food contamination in such combined kitchen/latrine areas must have been very high indeed. A similar combination of rooms was noted by Wikan in slum housing in Cairo where the kitchen “is always next door to the lavatory, and the door to the lavatory is usually in the kitchen. As a result the kitchen is the one place in the flat which is really pervaded by the stench from the lavatory. The lavatory itself is a room of about one metre square with a hole in the floor for waste... There is no ventilation and it is a favourite haunt of cockroaches.” A Roman would have found such an arrangement quite familiar.

Latrines at Pompeii are for the most part not provided with running water or washing facilities of any kind. Toilet paper was not apparently a standard item in

56 Cf. Mart. 3. 32, 15–17; digiti crepatiae signa novit eunuchus | et delicatae sciocitata urinas | domini bibendi ebring regit penem. For matellae made from various precious substances, see P. Howell, A Commentary on Book I of the Epigrams of Martial, London 1980, 185f.
57 J. Scarborough, Roman Medicine, London 1969, 78 seems to find such an arrangement satisfactory.
58 The gutter which conducted fluids from the kitchen into the cesspit was called trua; Varro LL 5. 25. 118; according to Mygind 313 if wood ash from the stove were thrown into the cesspit it would help to neutralize the smell of the latter, but according to B. Stone, The Shaoyang, China, Night Soil Fertilizer Reclamation Plant, in: Sewage Works Journal 21 (1949), 993 the result of such a combination would be the generation of free ammonia.
Roman latrines, though Catullus' reference to the annales Volusii as crassa caria (36.1), suggests that it was not entirely absent. For the Romans a sponge on the end of a stick performed the function of modern toilet paper. The main evidence for this is a passage in Seneca (Ep. 70. 26) where a German bestarius at a gladiatorial training school retires to a latrine where, to quote Seneca, Ibi lignum id, quod ad conundanda obscura adhaerente spongia posuit est, totum in culam fuisse et interdumus faeces spiritum distit. Ego huc morti contumeliam facere, Ita prores; parum mundi et parum decemt; nam est stultissimus quam fastidiosi mori? Martial (12. 48. 7) also refers to damnatas sponges virgae. The hygienic implications of using such an implement are again at best dubious. In many public latrines (foricae) a continuous shallow gutter is often found at the base of the seat. It has been assumed that this gutter was filled with water in which people rinsed out soiled sponges. However, this explanation can be regarded as nothing but conjecture, since these gutters might have served to collect urine which failed to enter the aperture in the face of each latrine seat.

The cesspit/latrine typical of Pompeian houses is also found in houses at Cosa, established as a Roman settlement in BC 273. The town was provided with an underground "sewage system", to which it seems domestic latrines were not connected. The usual arrangement at Cosa was for houses to have an underground cistern for water storage at one end of the house and a cesspit dug in unplastered fissured limestone at the other. The plastered cistern is often above the level of the cesspit thus avoiding, or minimizing the risk of water contamination through cesspit seepage. Many of the cesspits were at the rear of houses on plots which sloped towards gardens. In these cases seeping cesspit fluids would have escaped into gardens. At Pompeii the position of cesspits in relation to underground impluvium cisterns was not discussed by Mygind and awaits systematic investigation. At Cosa, as at Pompeii, cisterns are often provided with overflow pipes to conduct excess water directly into the streets, and kitchen/latrines are situated directly above, or very close to cesspits.

The evidence of Cosa and Pompeii shows that from the third century B.C. to A.D. 79 the Romans adopted standard measures for the disposal of human and kitchen wastes within atrium-type dwellings. In both towns the same solutions were adopted for channelling excess cistern water on to city streets. In both towns there is very little evidence for the discharge of wastes into sewers beneath the streets.

At this point it would be useful to try to determine why, when according to the Digest it was legally permitted, so few property-owners connected their dwellings to public cloacae. The expense of installing drains would seem at first sight to have been well within the consequent improvement in hygiene within a property. Yet current archaeological evidence shows very clearly that the inhabitants of Roman towns pre-

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91 See for example the plan of a very large forica (85 seats) at the entrance of the Roman agora at Athens, provided by M. Lang, Waterworks in the Athenian Agora, Princeton 1985, fig. 40; cf. also the latrines at Dougga: A. Mahjoubi, Les cités romaines de Tunisie, Tunis n. d., 97.
92 J. Bennett, Towns in Roman Britain, Aylesbury 1980, 14.
94 Brown (above n. 93) 64 and figs. 20, 33.
95 Ibid. figs. 81, 85–87, 89.
96 Ibid. In the house of Quintus Fulvius the curia and lavatorio are separate rooms connected by a doorway (fig. 87); cf. the House of the Skeleton (fig. 99) where the lavatorio appears to be furnished with a drain laid beneath the surface of the street.
97 See above p. 498f.
ferred internal cesspits to sewer connections. Why? There are several possible explanations. Firstly, Roman drains lacked traps to prevent gases such as hydrogen sulphide (H₂S) and methane (CH₄) escaping from sewers and thus causing not only an odor nuisance, but also the danger of explosions. Gravity sewers, the only type known to the Romans, are especially subject to the formation of slimes and sludge, which generates H₂S. On contact with air this gas forms sulphurous acid which, if unchecked, can lead to the corrosion of concrete. However, these conditions are most frequently associated with sanitary sewers designed to carry off only sewage and domestic waste water. Again, there is no evidence that the Romans built separate sanitary and storm water drains. They knew only combined sewers intended to carry away excess water from public water basins which flowed night and day, the overflow of domestic rain water cisterns, rain water which fell directly on to the streets, and lastly sewage which entered the drainage network through foriaca connected to cloacae, as, for example, was the case with the latrine at the Stabian baths at Pompeii. It might be argued that the constant flow of aqua caduca through a combined drainage system built with an effective fall from origin to exit point would keep it relatively clean and therefore free from noxious gases. On the other hand, it is known from several sources that Roman cloacae needed to be cleaned manually from time to time, a sure indication that by no means all Roman sewers were self-cleansing. Apart from evidence already alluded to in the Digest and Pliny the Younger, Libanius refers to the dangers of choking to death to which cleaners of cloacae at Ephesus were exposed.

It is also impossible to estimate the quantity of sewage which entered a Roman

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100 Gravity sewers designed to achieve self-cleansing velocities are free from this problem; JWPCF 42 [1970], 426: the minimum velocity required to prevent the deposit of solids "is not less than 21/2 ft per second when flowing full"; Supplement to Municipal Engineering 7 June 1968 (2. 01 sewerage). The Romans, however, were incapable of designing such drains, since they could not measure water velocities; on this latter point, see Robinson (above n. 25) 47.
102 For the advantages and disadvantages of separate/combined sewer systems, see Supplement to Municipal Engineering 7 June 1968 (2. 01 Design). In Britain combined Roman sewer systems have been found only at Lincoln, Colchester, and York; M. Redknapp, A Lavatory Seat from Netham, Hampshire, in: Britannia 7 [1976], 283.
103 Surplus water from the reservoir as well as water from the roof flushed this latrine which was connected by a drain running beneath the palaestra to the main collector in the via dell'Abbondanza; H. Eisebach, Die Stabianer Thermen in Pompeji, Berlin 1979, 32–36.
104 See above n. 71; Ulpian, Dig. 43. 23. 1–2.
sewer daily. Health engineers today estimate that an individual generates c. 70–80 grammes of solid wastes per day.\textsuperscript{106} Since this figure is made up of food as well as body wastes, an estimate of c. 50 grammes p.d. might represent more closely the amount of body waste generated by an inhabitant of a Roman city, this lower figure being preferable, since food wastes were unlikely to enter a Roman cloaca. Thus a city the size of Rome with a population of c. 800,000–1,000,000 inhabitants in early imperial times\textsuperscript{107} would have produced c. 40–50,000 kgs. of body wastes per day. What proportion of this estimated total entered the sewerage network cannot even be guessed. The Regionaries give a total of 144\textsuperscript{108} foricae for Rome in the fourth century, but this figure is of little value, since it is not known how many seats each forica contained, nor do we know what proportion of the population used public latrines. The situation is rendered more complicated by the fact that it is not known how many of Rome’s foricae were connected to the sewage network. So far only two foricae have been discovered at Rome, one of Hadrianic date above shops in the Forum Julium\textsuperscript{109}, the other in the area sacra del largo argentina\textsuperscript{110}, and the drainage systems of both appear not to have been reported. It can only be assumed that at Rome and Ostia where insulae greatly outnumbered domus, foricae would have been more heavily patronised than at Pompeii where even the smallest tabernae have latrines.

If the absence of traps might lead to unpleasant odors as well as to creating risks of explosions inside houses, there were at least two other potentially disagreeable consequences. Firstly, in low lying areas of Rome sewers could back up when the level of the Tiber rose. Thus sewage and waste water which normally flowed into the river via the Cloaca Maxima (and other sewers) would be forced back into the network, and up any house connections attached to the main collectors. Secondly, vermin in the sewers would be able to enter houses via any sewer connections. An anecdote in Suetonius, HA 13. 6 illustrates the danger in a somewhat spectacular manner.\textsuperscript{111}

All these reasons singly or collectively would tend to discourage domestic sewer connections. There is, however, a further reason which might have outweighed those already discussed. Inhabitants of western industrialized societies tend to overlook the fact that flush toilets, while being conducive to high levels of hygiene, are extremely wasteful both of fresh water and of substances which are useful as fertilizers. In many pre-industrial societies without access to artificial fertilizers, human excrement is frequently used as a supplement to animal manures.\textsuperscript{112} That the Romans

\textsuperscript{106} Information kindly given by Mr. Ian Gunn, Senior Lecturer, Department of Civil Engineering, University of Auckland.


\textsuperscript{108} Jordan (above n. 6) 445 n. 67. J. states without proof that the public latrines were connected with the public sewers; he makes a similar claim for latrines in private houses at Rome, a statement contradicted by the findings of Lanciani, and Pliny-Asby (above n. 80).

\textsuperscript{109} M. E. Blake, Roman Construction in Italy from Nero through the Antonines, Philadelphia 1973, 18f., pl. I fig. 2.


\textsuperscript{111} In this case an octopus swims up a house drain each night from the sea to eat pickled fish stored in the house by Iberian merchants.

\textsuperscript{112} R. H. Thomas, Wastewater Systems for Taipei, in: JWPCF 44 (1972), 16ff.; R. Stone,
used human feces for agricultural purposes is well attested. It is probable that those who emptied cesspits (stercorarii) sold their contents to farmers on city outskirts. At Pompeii in cases where cesspits are only deep enough to house a large amphora or dolium, the vessel when full would probably have been removed by a stercorarius and replaced with an empty jar. The references in the lex Julia municipalis and the Digest to sewage waggons are to be set in this context. A few houses at Pompeii have a drain leading from the latrine directly into a garden, but such an arrangement is rare and must have created a permanent stench in the gardens of the houses concerned.

Thus the domestic cesspit without sewer connections not only benefitted Roman agriculture but also provided a group of unskilled workers in the towns with work which was a source of regular pay, even though the work must have involved a high health risk. It seems, then, that stercorarii performed the same functions in Roman towns as koprolologi at Athens who, according to a recent writer, were not public slaves, but private entrepreneurs.

The collection and use of urine by fullers for mordanting certain dyestuffs reveals another area of private enterprise in the disposal and commercial exploitation of human wastes in Roman cities. However, the system of collecting urine was not hygienic since the terracotta jars placed in streets and alleyways were unglazed and porous, and sometimes cracked jars spilt their malodorous contents into the streets. Other methods of collection were both less public and more hygienic: for example, at the Baths of Mithras at Ostia a lead pipe from a urinal ducted fluids directly into a fullonica situated in the basement of the baths. However, this arrangement does not seem to have been attested elsewhere.

Insulae at Ostia were sometimes provided with communal ground-floor latrines. No detailed study of these amenities has yet been published, but some details may be gleaned from Packer's monograph on Ostian insulae. Of all the buildings discussed by Packer, only 16 contained positively identified latrines: Reg. I: ii.5; iii. 3, 4; vi. 1; vi. 1; xi. 2; xii. 1. Reg. II: iv. 3; v. 1. Reg. III: i. 9; v. 1; vii. 5; x. 1; xii. 1, 2.

The Shaoyang, China, Night Soil Fertilizer Reclamation Plant, in: Sewage Works Journal 21 (1940), 992.


114 Mygind 315.

115 Above n. 76; Ulpius, Dig. 23. 7. 12. 10 pleusura quibus stercus evacuatur; according to Paulus, Dig. 22. 1. 17. 5 the foroasi paid a tax to the fine.

116 House of the Silver Wedding; Mygind 315; White (above n. 113) 433.

117 A recent graffito from Herculaneum records the payment of eleven asses for the removal of ordure: exsust | stef(ro)ora aesibus XI; K. Schubring, Epigraphisches aus kampanischen Städten, in: Hermes 90 (1965), 243 n. 3.


120 Mart. 6. 93. 1f.; for urine jars in Ostia, see Meiggs 143.


122 The Insulae of Imperial Ostia, Rome 1971.
Reg. V: ii. 8; iii. 3; iii. 4. No details are given as to whether these latrines were connected to street sewers, or, as at Pompeii and Cosa, emptied into cesspits. The largest reported latrine is in I. xii. 1 where two ground floor shops were converted into one 21 seat latrine. The room preserves traces of a basin situated between the two revolving doors which gave entry to the latrine from the street. Only one other latrine reported by Packer contained a basin (III. vii. 5). Washing facilities in Ostian latrines seem, therefore, to have been as rare as they were at Pompeii. Five Ostian latrines were situated in subsecularia: I. vi. 1; vii. 1; xi. 2; xii. 2, 3. Contrary to Meiggs' statement that “in the tall buildings large pipes were provided to carry down the waste from the upper floors” (p. 143), Packer found only one example of such an arrangement in III. v. 1 where an upstairs latrine was connected by a pipe to a downstairs kitchen/ latrine. Nor does Packer report any evidence to corroborate Meiggs' further generalization that “small drains led from the blocks to the main drains under the streets, which ran in a gentle slope to the river” (p. 143).

Ostia seems to have lacked Pompeii's generous distribution of private latrines. A reason for this is the preponderance of insulae at Ostia which are not all provided with latrines. It is possible also that Ostia's higher water table would have made cesspits of any great depth impracticable. Further research on the drainage systems of the latrines recorded by Packer is essential before any certainty on the subject can be attained. It must also be assumed, as Meiggs does, that the lack of private latrines led to high usage of Ostia's 3 forosae as well as of those attached to thermae which were accessible to all members of the public, not merely to bathers. As yet 3 forosae along with the latrines of the town's 3 thermae can hardly be regarded as a "very generous supply of public accommodation" (Meiggs p. 596) for a population of c. 20,000 inhabitants. Two dungheaps, one next to the E. gate, the other in the city centre, discovered during the excavations of 1910 and 1920, suggest other solutions to the shortage of public latrines.

Evidence for the existence of private latrines at Rome is all but non-existent. There is no trace of latrines in the Casa di Giulio Romano, but it would be hazardous to suppose from this that all Roman insulae lacked latrines. The Domus Transitoria had a very large latrine (60-seater), once thought to be "the machinery chamber of a

113 Maritimae, Neptune, Forum. Such latrines were commonly situated in Roman public baths; D. Krencker, Die Trierer Kaiserthermen, Augsburg 1929, 185; Echbach, Die Stabianer Thermen (above n. 103) 361 (the earliest attested of such combinations); E. Brüchter, Die römischen Thermen und das antike Badewesen, Darmstadt 1985, 118-118 (Abortalanlagen). These latrines are particularly well preserved in N. African sites: J. B. Ward-Perkins, Roman Imperial Architecture, Harmondsworth 1981, 399, fig. 267 (Cicul) where latrines have been found in only 3 houses. One of these, an 8-seater in the House of Amphitrite is connected with the street sewer; M. Blanchard-Lemée, Maisons à mosaiques du quartier central de Djemila (Cicul), Paris 1971, 108, 208.; for latrines at the thermae of Volubilis, see R. Thouvenot, in: Publications du Service des Antiquités du Maroc 11 (1954), 55 who records that no latrines or kitchens have been found in houses at Banasa which lacks street drains. For Madauros, see S. Raven, Rome in Africa, London 1969, 90. Leptis (hunting-baths): J. B. Ward-Perkins–J. M. C. Toynbee–R. Fraser, The Hunting Baths at Leptis Magna, in: Archaeologia 93 (1949), 172, pl. XLI, 188.

114 J. Carcopino, Le droit romain d'exposition des enfants, in: Mém. de la soc. nat. des Antiq. de France 77 (1928), 75.; Mygind 289 f. refers to 3 refuse heaps at Pompeii, one inside the town near the Porta di Ercolano, two just outside the Porta Stabiana.
hydraulic lift", but very obviously a latrine of the usual "key-hole" design; yet, again, the archaeological literature says nothing about drainage arrangements. Lanciani found evidence of only one private latrine at Rome, a cesspit dug in clay subsoil and brick-lined. It had no sewer connection. Lanciani also discovered some 75 large pits (puticis) in the area of the Esquiline graveyard, filled with a nauseating mixture of the corpses of the poor, animal carcasses, sewage, and other garbage. Cippi were found in this area warning Romans not to dump sewage and corpses within the area delimited by the stone markers.

A passage in the Digest (Papinian) at 43. 10. 1. 2 not only prohibits the digging of holes in the streets, a measure which would have ruled out the typical Athenian latrine described by Owen, but also outlawed the throwing of excrement, corpses, and (animal) skins on to the streets (43. 10. 1. 5). It was likewise an offence to contaminate the public water supply or cover anyone with dung or filth (47. 11. 1. 1). An inscription found above a public water basin at Pompeii prohibiting the pollution of the water with excrement, shows that officials found it necessary to warn would-be delinquents. As to covering people with filth, this is precisely what Caligula as reported by Suetonius (Vesp. 5. 3), did to Vespasian when the latter was a city sedile and who in the eyes of the emperor had failed to keep the city's streets clean.

That many insulae in Roman insulae flouted some or all of these laws is clear from other passages in the Digest where the question of damages is discussed in relation to those injured by debris and waste thrown from the windows of multiple dwellings. On the other hand, the mere creation of a bad smell in the vicinity of a public road did not render the creator of the smell liable to prosecution (43. 8. 2. 29), a law which presumably allowed cesspit latrines in houses to be situated close to street fronts.

According to Lanciani, large perforated manhole covers in some of the streets of Rome, not only admitted storm-water to the sewers, but also emitted "poisonous effluvia". Some of these foramina must have been quite large and not always well-protected, since the grammaticus Crates Malleotes, credited by Suetonius with the introduction of secondary education to Rome, fell down one in the Palatine region and

122 Plutarch, A Topographical Dictionary (above n. 9) 198; Nash (above n. 110) 375 (plan) pl. 461, said to be "for palace servante"; the latrine is beneath the triclinium and peristyle of the Domus Flavia.
123 Recenti scoperchi di Roma e del suburbio, in: Bullettino Commissione 29 [1892], 286.
124 Ancient Rome in the Light of Recent Discoveries, New York 1899, 64f.
125 CIL 6. 21615 stercus longe uter ne malum habet; on which see Gordon, in: G & R 20 [1951], 77-79; CIL 17, 401 (Luceria) in hoc loco quid sterns nuce fundati nee cadaver praecepi; discussed by Schubring (above n. 117) 243f., who refers to other prohibitions of this kind; further discussion by Curtis, in: TAPA 110 [1980], 86.
126 Above n. 112, 47.
127 Schubring (above n. 117) 243f.
129 Above n. 127, 66 and facing plate for an illustration of the "Bocca della Verita", a large manhole cover. L. does not say what the "poisonous effluvia" were, or how they were created, but see above p. 412.
130 De gramm. et rhet. 2.
broke his leg. Also the much hated Heliogabalus, if his biographer is to be believed, was unceremoniously pushed down a sewer after being assassinated in a latrine.

Insularii who did not have a ground-floor latrine in their block, could resort to foricae, or use a variety of portable vessels in their own apartments. There were other possibilities. At Pompeii and elsewhere there is abundant evidence showing that many people relieved themselves in streets, doorways, tombs, and even behind statues. The occupants of rooms in the upper storeys of insulae would find it more convenient to tip the contents of matellae and larinae out of windows at night when no one could identify the culprits, than to descend several flights of stairs to the communal latrine (if one existed), or to walk in the unlit streets to the nearest foricus and risk being mugged or murdered (Juv. 3. 299–305).

It is unlikely that the 116 latrines (necessariae) incorporated into Aurelian's wall were used by the general public, since they were on the same level as the rampart walk, a position which suggests that they were built for the use of soldiers on garrison duty, not for civilians. The outlets from these latrines were at a later date fitted with shoots which ducted wastes into pits at the base of the wall. These were not connected to drains. Before the shoots were attached to the latrines privy-flush would have dropped to the ground below and its removal would have depended on the efficiency of the city sœdis.

The general impression gained from the admittedly very limited archaeological and literary evidence discussed above is that the inhabitants of Rome lived in an extremely insanitary environment which was in many respects similar to that in large European cities till shortly after 1842 when Edwin Chadwick's "Sanitary Report" was published in London and drew wide attention for the first time to the appalling consequences of inadequate waste disposal in large cities. Braudel's description of Paris in the sixteenth and seventeenth centuries might be applied to ancient Rome without major modifications: "chamber pots . . . continued to be emptied out of windows; the streets were sewers. For a long time Parisians relieved themselves under a row of yews in the

118 SHA, Helig. 17. 1–2 the sewer was too small; but cf. 33. 7 Sordidissime per cloacas ductus.

131 For a full discussion, see E. Magaldi, Di un particolare ignorato e strano del culto della dea Fortuna, in: Il Folklore Italiano 10 (1932), 97–100 who discusses the significance of graffiti such as the not infrequent sexto cava malum; see also O. Jahn, Über den Aberglauben des bösen Blicks bei den Alten, Berichte über die Verhandlungen der sächs. Gesell. d. Wiss. 7 (1855) who points out (192) that statues of people in the act of defecating were used to avert the influence of the evil eye; see further M. della Corte, Case ed abitanti di Pompei, Rome 1864, 78, 83, 306.

135 For the fouling of statues Juv., Sat. 1. 131; A. Bauman, Impietas in Principem, Munich 1974, 82–85; for the fouling of other places, D. Feilinger, Ethologische Überlegungen, Munich 1974, 34.

137 See J. A. Richmond, The City Wall of Imperial Rome, Oxford 1920, 85 f. for an indignant account of the system. Only one of these latrines survives today in the wall to the E. of the Porta Salaria; see G. Lugli, Monumenti antichi di Roma e suburbio vol. 2, Rome 1834, 158 f. and fig. 24; E. Nash, A Pictorial Dictionary of Ancient Rome vol. 2, London 1962, 88.


17 Klio 68 (1980) 2
Tulleries; driven from there by the Swiss guards, they betook themselves to the banks of the Seine, which was equally revolting to eye and nose".

So far attention has been given to the nature of Roman public and private latrines. It would be appropriate at this point to ask how (and by whom) the human and animal wastes which clearly must have fouled Rome's streets, were removed. The cleanliness of the city's streets was the responsibility of the sediles as part of their cura urbis. However, there was no official street cleaning service at Rome. Those who occupied properties with adjoining street fronts were responsible for keeping them clean. The overflow from public basins would have flushed only some of the filth from the streets, since there were not enough basins (see below, p. 423) to provide sufficient water to wash down all road surfaces in the city. Dogs and carrion birds such as vultures must also have played a significant part in the disposal of assorted street refuse. Dogs were to be found in many Roman houses where they disposed of food scraps in dining rooms; they also consumed human excrement as Martial twice points out, as well as corpses which, despite legal prohibitions, seem to have been dumped in the streets of Rome as they were at Antioch. Suetonius records that while Vespasian was lunching (Vesp. 5.4) a dog from the street (canis extrarius) brought a human hand into the dining room and deposited it beneath the table. A portentous event, since it concerned an emperor, but such happenings were probably not rare at Rome or in other large cities in the Roman empire. In one of Phaedrus' fables (1.27) a dog is moralised by a vulture for digging up human bones. The origin of the dog is interesting: triino conceptus, educatus stercore (1.27.11). Before the pestilential Esquiline cemetery became the gardens of Maecenas, dogs must have been a common sight there fossicking among the many shallow or open mass-burial pits from which fragments of corpses could be conveyed to various parts of the city. Evidence that dogs (and other animals) gnawed improperly buried corpses has recently been reported from a Romano-British cemetery.

141 G. Lugli, Studi minori di topografia antica, Rome 1985, 231.
142 Dogs seem to have been kept even by the poor; Paulus, Dig. 9.1.2.1 ei quis aliquem evionem, magistratum forte, in taberna proxima se inmittisset ibique a cane feroce lacus esset...
143 Mart. 3.82, 18ff. while a dinner is in progress; 7.20.16f.
144 1.33, 12.48.8.
146 "Wherever a body was found in the city [sc. Antioch] it was the duty of the ἐπισκευαστής τῶν φυλῶν to inform the governor." J. H. W. G. Liebeschuetz, Antioch: City and Imperial Administration in the Later Roman Empire, Oxford 1972, 123; bodies were also found in the streets of Athens, as Arist., Ath. Pol. 50.2 shows.
148 A. McWhirr et al., Romano-British Cemeteries at Cirencester vol. 2, Cirencester 1982, 194ff.; 50% of the skeletons examined had been gnawed; see also E. E. Burie, Superstitions about Dogs in Latin Literature, in: CP 80 [1985], 37f.; S. Lilija, Dogs in Ancient Greek Poetry, Helsinki 1978, 18f.
In a poem about the hardships of a beggar's life, Martial (10. 5. 11f.) depicts a despondent man in his dying moments listening to dogs howling in anticipation of eating his corpse; at the same time he tries to keep birds of prey (nuxias aces) at a distance by flapping his rags at them. A gruesome, but probably commonplace event in the capital. The poor and destitute, lacking concerned relatives, would be left to rot in the streets, though if Martial's picture is accurate, dogs and vultures would set to work before a cadaver had time to putrefy.

At least some of the corpses in Rome's streets would be those of unwanted infants deposited on dung heaps, a custom attested in Greek cities also. It is impossible to determine how many infants exposed in this manner would have survived. Some were undoubtedly saved by slave dealers to be trained and sold off at a later date. Cognomina such as Stercorarius, Stercorius, etc., many of which have been found in African inscriptions, are attributed to such foundlings by Lassé, though Kajanto previously doubted such a derivation. Many exposed infants also died as a result of cold, starvation, or the attack of dogs and other predators. It also seems that the corpses of gladiators of servile status were thrown on garbage heaps, though evidence for this is so far confined to Sassina.

Sick, dying, and dead slaves were also to be found in the streets of Rome, though the Tiber island was the traditional centre for depositing such slaves who had not been killed by their owners when they had become either incurably sick or debilitated by old age to the point where the slave was considered useless by his dominus.

Since dogs were specifically excluded from the provisions of the lex Aquilia; it is likely that they were exploited as a food source by the starving. Martial (6. 93. 4) mentions the smell of a hide torn from a dog in the Transalpina area, a detail which suggests that tanners rounded up stray dogs to obtain cheap skins to turn into leather. This type of exploitation would have helped to control the number of stray dogs in Rome's streets. A similar expedient was recently used in a part of the Federal District

152 P. A. Brunt, The Roman Mob, in: P & P 35 [1966], 37f. claims that beggars are hardly ever mentioned in Latin literature, an observation also made by J. P. V. D. Balsdon, Life and Leisure in Ancient Rome, London 1958, 268; but there is plenty of evidence for their activities at Rome and elsewhere, see TLL 8 (1966) s. v. mendicatio—mendicium. The practice of malnourishing children to make them appeal to the sympathy of passers-by (Sen., Contrav. 10. 4) is also attested at Antioch; Joh. Chrysost., Hom. in Ep. I ad Corin. 21. 5 (PG 61, 175–179).

153 I. Kajanto, On the Problem of Names of Humility in Early Christian Epigraphy, in: Arcadia 5 [1982], 49 ignores Juvenal Sat. 8. 603 when saying "there are no references in Latin literature to exposing children on dunghills"; see Courtney ad loc. who translates lacus as "public latrine"; "open cesspit" might be a more accurate rendering. Livy 34. 44. 5, refers to the lining of such pits at Rome by Cato in BC 184. This reference must surely be to cesspits, and not to public water basins (lacus) which could hardly function if left unlined.


155 Tert., Ad Nat. 1. 15. 2–4; Apol. 9. 7; Min. Fel. Oct. 30. 2; cf. also Artemidorus 2. 9 for the association of the poor with dungheaps.

156 G. Ville, La gladiature en Occident, Rome 1981, 462f.


158 Gaens, Dig. 9. 2. 2. 3 conter pecules non est.
of Mexico City where the skins of numerous stray dogs were turned into leather goods for tourists.\footnote{Los Supernachos vol. 16 No. 634, Feb. 23, 1978, 29; the inhabitants of Milpas Altas (c. 160,000) were outnumbered by the dogs in the locality.}

Though these animals helped to eliminate organic matter from houses and streets, they would also have been carriers of a wide variety of diseases ranging from rabies to skin diseases such as ringworm.\footnote{P. Dale-Green, Dog, London 1966, 146f.; R. H. A. Merlen, De Canibus, Dog and Hound in Antiquity, London 1971, 70–81 (tables); ringworms, mange, etc. 67.} Their feces would also have fouled the streets and in some cases have contaminated the water in public basins, and even the carcasses of the dogs themselves might find their way into the water supply.\footnote{R. H. A. Merlen, De Canibus, Dog and Hound in Antiquity, London 1971, 70–81 (tables); ringworms, mange, etc. 67.}

Vultures, also necrophagous scavengers, were familiar enough to Romans\footnote{C. Imai, Study on Ecology and Control of the Housefly at a Waste Disposal Site, in: Osaka and Its Technology 1 (1982), 38; open cesspits would also attract flies; R. H. Thomas, Wastewater Systems for Taipei, in: JWCF 44 (1972), 1612 “unscreened or poorly screened night soil latrines are a prolific source of fly breeding. Such latrines are therefore presumed to have an important role in the transmission of feaces-borne diseases”.} for Seneca (Ep. 95. 43) to compare a capitator sitting at the bedside of a patient to this predator: vultur est, cadaver expectat. As potential spreaders of diseases vultures were less of a threat than dogs, since there would be less possibility of direct human contact with them. But, as happens today in Bombay where the Parsis\footnote{C. Imai, Study on Ecology and Control of the Housefly at a Waste Disposal Site, in: Osaka and Its Technology 1 (1982), 38; open cesspits would also attract flies; R. H. Thomas, Wastewater Systems for Taipei, in: JWCF 44 (1972), 1612 “unscreened or poorly screened night soil latrines are a prolific source of fly breeding. Such latrines are therefore presumed to have an important role in the transmission of feaces-borne diseases”.} expose their dead for ritual consumption by vultures, a nuisance could be created when the airborne birds dropped carcass fragments onto and around houses.

Another common nuisance resulting from the exposure of filth and carrion in the streets was the fly. As Lucian says in his panegyric of the insect,\footnote{C. Imai, Study on Ecology and Control of the Housefly at a Waste Disposal Site, in: Osaka and Its Technology 1 (1982), 38; open cesspits would also attract flies; R. H. Thomas, Wastewater Systems for Taipei, in: JWCF 44 (1972), 1612 “unscreened or poorly screened night soil latrines are a prolific source of fly breeding. Such latrines are therefore presumed to have an important role in the transmission of feaces-borne diseases”.} “they are born as maggots from the dead bodies of humans or animals and live on the same food and eat at the same table as man.” Human and animal manure also provide ideal breeding grounds for blow flies\footnote{C. Imai, Study on Ecology and Control of the Housefly at a Waste Disposal Site, in: Osaka and Its Technology 1 (1982), 38; open cesspits would also attract flies; R. H. Thomas, Wastewater Systems for Taipei, in: JWCF 44 (1972), 1612 “unscreened or poorly screened night soil latrines are a prolific source of fly breeding. Such latrines are therefore presumed to have an important role in the transmission of feaces-borne diseases”.} which can transmit many diseases to humans. The Romans knew of some fly-repellents such as a mixture of coriander seed and olive oil which was smeared on house walls,\footnote{C. Imai, Study on Ecology and Control of the Housefly at a Waste Disposal Site, in: Osaka and Its Technology 1 (1982), 38; open cesspits would also attract flies; R. H. Thomas, Wastewater Systems for Taipei, in: JWCF 44 (1972), 1612 “unscreened or poorly screened night soil latrines are a prolific source of fly breeding. Such latrines are therefore presumed to have an important role in the transmission of feaces-borne diseases”.} yet such remedies would not have been available to the poor, and even the rich could not have found them effective, especially in summer tristitia which were often open on three sides. Thus it was sometimes felt necessary to employ a slave to keep flies from settling on guests and food in dining rooms.\footnote{C. Imai, Study on Ecology and Control of the Housefly at a Waste Disposal Site, in: Osaka and Its Technology 1 (1982), 38; open cesspits would also attract flies; R. H. Thomas, Wastewater Systems for Taipei, in: JWCF 44 (1972), 1612 “unscreened or poorly screened night soil latrines are a prolific source of fly breeding. Such latrines are therefore presumed to have an important role in the transmission of feaces-borne diseases”.} Roman food shops, unprotected by windows or screens and bordering on dirty streets, would also have been infested by flies. This would be especially likely in the case of butchers' shops where it seems animals were slaughtered before being cut up for sale. Rome did not have a centralized slaughter-house from which meat was distributed to retail outlets. The animals were bought live in the appropriate forum (boarium, suarium) and driven live through the streets to butchers' shops where they were

\footnote{C. Imai, Study on Ecology and Control of the Housefly at a Waste Disposal Site, in: Osaka and Its Technology 1 (1982), 38; open cesspits would also attract flies; R. H. Thomas, Wastewater Systems for Taipei, in: JWCF 44 (1972), 1612 “unscreened or poorly screened night soil latrines are a prolific source of fly breeding. Such latrines are therefore presumed to have an important role in the transmission of feaces-borne diseases”.}
Slaughtered, disembowelled, and dismembered. Sheep, pigs, and cattle en route to city markets or shops were a hindrance to pedestrians and no doubt contributed to the general fouling of the streets with excrement. The above mentioned (p. 416) prohibition in the Digest against throwing skins into the streets suggests that, as in Ispan in the seventeenth century, butchered used the streets as a dumping ground for blood and abattoir-wastes which could not be sold. The average ox contains c. two gallons of blood, and though some of this might be used in preparing blood sausages, a great deal would remain to be disposed of.

It is clear that in Rome there was a very high risk of food and water contamination through direct or indirect contact with human or animal fecal matter which was inadequately dealt with by city authorities. Open cesspits in kitchens, a general lack of washing facilities in latrines, defecation and urination in the streets, the pollution of water basins with carrion and filth, lack of efficient fly control, and inadequate street cleaning, do not provide a basis for health in an urban community, but do help to explain a very high mortality rate.

What diseases in particular are associated with the above environmental conditions? The most common are cholera, dysentery, gastroenteritis, infectious hepatitis, leptospirosis, and typhoid. Potential pathogens such as salmonella, a species of which causes typhoid fever in man, and pseudomonas are often found in human and animal feces and wastewaters. Salmonellae are commonly carried by blow flies, dogs, cattle, pigs, and poultry. Leptospirosis, a species of which can cause a type of jaundice ("Weil's disease") to which sewer workers are prone, is found in the urine of infected pigs, dogs, and rats, and is potentially fatal. Other common genera of pathogenic organisms which can be found in water contaminated by infected feces are vibrio (cholera), shigella (dysentery), mycobacterium (tuberculosis, leprosy), and pastereulla (classical plague). Tapeworms which if left untreated in humans, can

165 Lanciani (above n. 10) 514; there was a corporation of lamii in the region of the Piscina publica (CIL 6. 975).
167 Braudel (above n. 130) 507.
169 E. E. Geldreich, Microbiology, in: JWPCF 42 [1970], 1051–1077 (with very extensive bibliography). All these diseases were known in seven Italian regions; see D. Brothwell—A. T. Sandison (edd.), Diseases in Antiquity, Springfield 1961, 117 (leptospirosis), 124 (dysentery, hepatitis, typhoid); little is known about cholera prior to 1517, yet Asiatic cholera has been identified from Biblical sources (213). Celsus 4. 15. 1 comments that cholera was especially common in children. He also refers to the discharge of bloody mucus (tenesmo) typical of the disease; T. C. Allbutt, Greek Medicine at Rome, London 1921, 339. Celsus does not refer to Asiatic cholera, see Spence's note on de Medic. 4. 15. 1.
171 Geldreich (above n. 160) 1059.
172 D. J. Reasoner, Microbiology, Detection of Bacterial Pathogens, in: JWPCF 46 [1974], 1296.
173 Ibid. 1401.
cause hydatid cysts on the liver, live in dogs' intestines. Humans can be infected by ingesting eggs from a dog's excrement. Other parasitic worms which can cause intestinal infestations, round worms and thread worms, are commonly transmitted through fecal contamination.\textsuperscript{175} The tetanus anerobe is also passed in feces and may be present on roads and in the soil of gardens.\textsuperscript{176}

Since human excrement was used to manure gardens and fields, there was a risk that vegetables so fertilized would be contaminated with some of the above mentioned viruses, bacteria, and worm-eggs.\textsuperscript{177} Romans were also exposed to diseases transmitted by fish which fed on sewage.\textsuperscript{178} Several literary authorities refer to fish caught in the Tiber, usually identified as bass, which fed on sewage.\textsuperscript{179}

Babies and young infants, as well as undernourished adults, would be particularly susceptible to these infections and infestations. A dangerous stage for infants would occur at the time breast feeding ceased, since at that point they would be exposed to infections from unclean containers and contaminated food. The result must often have been gastroenteritis, dysentery and death through dehydration.\textsuperscript{180}

It is not surprising that Bonner found that the most common of all the medical amulets studied by him were for stomach ailments and "colic".\textsuperscript{181} It is also probable that diseases and parasitic infestations caused ultimately by the improper disposal of wastes would occur concurrently with other types of diseases, such as malaria which is known to produce high infant mortality.\textsuperscript{182}

Before condemning inadequate sanitation as being the most likely single cause of low life expectancy in large Roman cities, something must be said about hygiene in Roman public baths which are often thought to have compensated for the lack of washing facilities in most Roman dwellings. Some comment on Roman urban water supply is also necessary to complete the picture of Roman sanitation.

IV Water Supply

As Frontinus points out,\textsuperscript{183} prior to the building of the \textit{aqua Appia} in BC 312, Romans depended on wells, springs, and the Tiber for their water supply. As the population of the city grew, the demand for water also increased. In the time of Augustus, Agrippa more than doubled the previous supply,\textsuperscript{184} one reason for this being that extra water

\textsuperscript{175} J. F. Murand—G. T. Bazer, Diplogasterid and Rhabditid Nematodes in a Wastewater Treatment Plant, in: \textit{JWPCF} 42 [1970], 106–114; Celsus says children were particularly prone to threadworm infestation (4. 24. 2); cf. Oto, RR 125 for \textit{tenesmata minoria}.

\textsuperscript{176} Brothwell—Sandison (above n. 169) 116, 241f.; Celsus 4. 6.

\textsuperscript{177} W. Rudelof, Contamination of Vegetables Grown in Polluted Soil, in: Sewage and Industrial Wastes 24 [1951], 253–268.

\textsuperscript{178} Fecal coliform bacteria "occur in great numbers in fish living either in a polluted stream environment, or in fish that are bottom feeders or scavengers living in a relatively clean stream"; JWPCF 48 [1971], 622.

\textsuperscript{179} See R. Marsache, Juvénel, Paris 1985, 131 on Juv. 5. 104.

\textsuperscript{180} Brothwell—Sandison (above n. 169) 93.

\textsuperscript{181} C. Bonner, Studies in Magical Amulets, Ann Arbor 1950, 51–66.


\textsuperscript{183} De aquae 1. 4.

\textsuperscript{184} H. B. Evans, Agrippa's Water Plan, in: \textit{AJA} 86 [1982], 411.
was needed for Agrippa's baths in the Campus Martius which set a precedent for public munificence followed by many later emperors. In the times of Frontinus a total of nine aqueducts provided the city with c. 992,000 m³ of water a day. Most of the this water was potable with the exceptions of Tepula (tepid water) and Alaisina built in BC 2 to supply the Naumachia in Regio 14. Unfortunately almost nothing is known about the distribution of water within the city of Rome. Frontinus (78. 3) says there was a total of 591 open water basins (lactus) within the city from which most Romans would have collected their daily supplies. The positions of Pompeii's 40 lactus are precisely known. A distribution map recently published by Eschbach shows that they were very evenly distributed throughout the town, with the exception of Regio 6, a poor quarter, which has fewer basins than other regions so far excavated. At Rome even the approximate location of most of the basins is not known. One of the few to have been excavated and identified, the lacus Servilius, was situated in the Forum, fed by a branch of the highly prized aqua Marcia, and drained directly into the Cloaca Maxima which as Pliny says sometimes flooded the Forum with its backwash. Even without the complication of backwash, a direct untrapped drain connection between this basin and a sewer main has a potential for contamination. The central position of this basin probably explains why it was chosen during the Sullan proscriptions for the exhibition of senators' heads which were fixed above and round the water tank, thus creating an additional, if temporary, risk of pollution. Pompeian basins do not appear to have direct sewer connections. They are mostly tanks constructed of monolithic stone slabs placed at the edge of roads into which they overflowed. The Servilius basin is a paved depression in the ground and was presumably linked to the Cloaca Maxima because it passed conveniently below the Forum. The continuous flow of water into and out of these basins would retard the growth of weed and algae in the tanks, but not prevent it, so the tanks must have required periodic draining and cleaning to remove accumulations of slime and other extraneous rubbish. There can be little doubt that those who drew their drinking water from such tanks were more at risk than the few who had water piped directly into their homes from covered distribution tanks (castella). Yet because of its relative cheapness and malleability, lead was frequently used for domestic water supply, despite Vitruvius' warning against its use. However, as Hodge points out, it is impossible to gauge the likely toxicity of lead-conducted water, when it is not known whether the water

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132 Lavedan (above n. 15) 285f.; his estimate of c. 1,000 litres p.d. per inhabitant fails to account for loss of water through leaks, illegal tapping, and evaporation.

133 Despite Vitruvius' warnings about using marshy water for town supply (8. 1. 3) the aqueducts of Tingad and Cherchel drew on aquaperolentienis; P.-A. Février, Urbanisation et urbanisme de l'Afrique romain; in: ANRW II 10. 2 [1982], 365.

134 Robinson (above n. 28) 50 (Tepula), 58 (Alaisina).


136 Patnert—Ashby, A Topographic Dictionary (above n. 8) s.v. issues.


138 NH 36. 104.

139 Patnert—Ashby (above n. 190) 314.

140 J. D. C. Boulakia, Lead in the Roman World, in: AFA 76 [1972], 143.


142 Ibid., 488.
in question is soft or hard. Hard water will quickly insulate the inside surface of a lead pipe with a harmless deposit of lime, whereas soft water is plumbosolvent and consequentlly a potential hazard to a consumer, who is at risk (according to Hodge p. 487) when lead intake exceeds 0.6 mg p.d.

The Romans were exposed to lead poisoning from sources apparently unsuspected by Vitruvius. Finley, citing an unpublished paper, states that the Roman wine-additive *esopo/defrutum* was "prepared by simmering must over a slow fire in a leaden vessel ... the result, about 20 mg. of lead per litre of wine, means that the Romans were systematically giving themselves lead poisoning for centuries, with a consequent increase in mortality and decrease in fertility". At Pompeii many lead and bronze cauldrons have been found built into the masonry counters of *thermopolii* where low-status customers congregated for refreshments. In these circumstances there would be a risk of a double-dose of lead-poisoning. The wine put in the cauldron by the shopkeeper would in some cases already be contaminated by lead-polluted additive. When this was reheated in the cauldron more lead would have been leached by the wine from the inside of the vessel. These circumstances perhaps help to explain the question asked by T. Waldron in connection with the cause and source of the high lead content he detected in skeletons found in the Romano-British cemetery at Cirencester.

Quantitatively the inhabitants of Rome were provided with a more than adequate supply of water, at least from the time of Augustus, but the quality and purity of this water once it reached the *cenacula* and *cellae* of the city’s apartment buildings could hardly be vouched for, since there were pollution risks not only at open public basins (sewer connections, casual refuse disposal), but also from contaminated containers used by *inquilini* and *aqua». It might be argued that in smaller Roman towns inhabitants relied on rainwater collected in domestic cisterns, if a town was not supplied by an aqueduct or, if it was, repairs necessitated the temporary suspension of such a supply. As Duncan-Jones points out "Roman towns were able to function without aqueducts. Virtually all towns including those that built aqueducts had a history of subsisting without them". This generalization appears to be applicable to towns in Roman Africa, but hardly applies to post-Augustan Rome where the bulk of the population lived in *insulae* which lacked the internal water cisterns commonly found in atrium-houses. The very history of aqueduct construction at Rome shows that the earliest ducts were built in response to the need of an expanding population for more water. A passage in the *Digest* states quite clearly aqueduct repairs were thought more important than the repair of roads since, if the former were neglected, people would die of thirst.

198 Lead was used as an alloy in bronze; Boulaia (above n. 194) 144.
199 Wacker, Inns at Pompeii (above n. 21) 6, 18, 35, 49, 48.
200 In: McWhirr et al. (above n. 148) 263. Waldron asks how the lead entered the food and drink of those who "were heavily exposed to lead exposure on a massive scale".
203 Venuleius, Dig. 43, 21, 4: non rejectis rivis omnis usus aquae auferretur et homines eiti necarentur.
V Baths

Neiggs' statement that "it was in the public baths that the Romans kept clean" (p. 464) reflects a generally held belief that a lack of domestic bathrooms in all but the houses of the very rich was compensated for by the ample provision of public bathing facilities. There is clearly some truth in this belief, but the generalization requires some qualification.

That the ancients themselves associated the baths with health is evident from the fact that the deities most frequently represented in thermae were Asclepius and his daughter Hygieia. This association had a particular significance for the sick and infirm who, as will be seen from passages in Celsus, were advised to go to baths to facilitate cures for various diseases. Hadrian's biographer says this emperor ordained that only the sick should use the baths before the eighth hour. Presumably prior to this ruling the sick and the healthy bathed together.

A review of Celsus' De Medicina shows that patients suffering from a broad range of ailments and diseases were advised to go to the baths as an essential part of their prescribed treatment. Sometimes particular parts of the bath-complex are specified, such as the laconicum (dry heat), natatio (cold pool), or sudium (hot pool). Apart from general unspecified illness (languor) for which Celsus advises a visit to the baths as one of several remedies (3. 2. 6), particular illnesses are also listed for treatment in the baths: fevers, possibly associated with typhoid or malaria, (2. 17. 2; 2. 17. 7; 3. 6. 14; 3. 12. 3); tuberculosis (3. 22. 1 and 6); paralysis (3. 27. 5); headaches caused by malarial infections (4. 2. 8); liver abscesses (4. 15. 4); cholera (4. 18. 1 and 5); dysentery (4. 23. 3); worm infections (4. 24. 2); bowel troubles (4. 25. 2) where the patient is advised to sit in a hot pool and bathe his anus frequently; diarrhoea (4. 26. 2); gonorrhoea (4. 26. 1); rabies (5. 27. 2B); boils caused by streptococcal infections (erisypelas, 5. 28. 4D); psoriasis (5. 28. 19D); phthisis (lice infected eyelashes, 6. 6. 15B); ophthalmia (6. 6. 17); apthae (mouth ulcers, fatal in children, 6. 11. 3). In view of this, it is perhaps hardly surprising that Celsus says infected wounds should not be treated in the baths, since the bath water renders them dirty (sordidum reddit, 5. 26. 28C).

Hadrian's measure to give the sick the exclusive use of the baths till the eighth hour was perhaps motivated by a wish to protect the healthy from the unhealthy rather than from a desire to spare the sick the embarrassment of exposing their ailments to the gaze of the curious and the derisive. Yet it is not clear that the Romans were aware that diseases such as cholera and dysentery could be transmitted by water as well as by direct contact.

There is no evidence that the Romans used disinfectants in the sudia, alvei, and natationes of their public baths. Today public swimming pools are usually equipped with filtering systems and water is chlorinated to minimize viral and bacterial contamination deriving from bathers. On the other hand, water probably flowed in and out of the pools in Roman public baths, as was the case with public water basins. However, as yet the water systems of Roman baths are not sufficiently known to...
support generalizations of this kind. The natatio of the Stabian baths at Pompeii has in its S. E. corner a drain which ducted the overflow of the pool into the main collector in the via dell’Abbondanza. 267 Exit pipes also connect the cold pool of the frigidarium and the labra in the men’s (and women’s) caldaria to the same drainage network. However, no such outflow pipes are attached to the alae 268 of the men’s tepidarium and caldarium. How often were all these basins and pools drained and cleaned? At present there is no evidence on which to base an answer, but it must be assumed that such pools were periodically cleaned to remove slime and sediment. Seneca (Ep. 86. 10) says it was the responsibility of the aediles 269 to supervise the general cleanliness (munditia) of public baths. He also mentions as a sign of contemporary over-refinement in bathing habits the use of filtered water (saccata aqua 86. 11), but such a luxury is likely to have been confined to baths in the houses of the rich.

It is conceivable that some of the sick who could afford the higher entry fee would for the sake of greater privacy prefer to go to private commercially run baths for therapeutic purposes, though as Martial shows, some of these establishments had unsavoury reputations. 270

Could a bathkeeper (balineator) exclude clients if he considered them undesirable for some reason? It seems from Martial 3. 93 that he could. In this instance a bathkeeper admits a diseased old woman only after extinguishing the lights, and then only in company with the lowest type of prostitutes (bustuarias moechae). That some Romans found the sight and smell of some bathers offensive, is clear enough from Martial (6. 93) and Juvenal (5. 90) where there are also racial overtones. The sight of diseased people at the baths would be more obvious, since it seems to have been normal for both sexes to bathe unclothed. 271 Though Artemidorus (1. 64) says the sick entered the baths clothed, it is difficult to imagine how they could remain clothed when sitting in the various pools and basins in the public baths. Ausonius, Epig. 106 suggests that the sick were unclothed when they entered plunge pools.

It seems probable, then, that Roman public baths might not have been as sanitary as is commonly assumed, and that the risks of becoming infected with a wide range of contagious and infectious diseases in such establishments would have been great.

In the sixth and seventh centuries public baths in the Eastern Roman empire continued to attract the sick. Plentiful evidence from this later period also shows that

267 Eechbach, Die Stabianer Thermen (above n. 103) Taf. 29. A full reconstruction of the water system of these baths has still to be published (36). The cold plunge pool of the Roman baths at Bath was connected to a drain; B. W. Cancliffe, Roman Baths at Bath, in: Britannia 7 (1976), 9.

268 According to A. Mau—F. W. Kelsey, Pompeii, New York 1935, 1936. alae in the caldaria contained openings to enable the tank to be drained onto the mosaic floor.

269 Above n. 149; Sallustus, NA 10. 3. 3 retells a passage from the de legibus promulgatis of C. Gracchus in which a consul’s wife visiting Teanum Sidicinum had the local quaeator publicly flogged because the men’s baths were not vacated quickly enough, and were not sufficiently clean (laudae).

270 1. 59. 3; 2. 14. 12; 3. 20. 10; 7. 34. 10; 11. 52. 4.

271 Howell (above n. 86) 156 where Balsdon’s assertion to the contrary is corrected. However, H. overlooks the evidence of Artemidorus; Ausonius, Epig. 106 about a person who washed sicutere scabies putrefactus in the hot pool (sollum) of public baths, shows that the sick were unclothed sometimes.
the ill preferred to visit the baths at midday or at night when the general public did not frequent them. In the West public baths lingered on till the sixteenth century when a combination of church preaching and syphilis led to their demise.

VI Overcrowding

The third and last point in Townsend's index of substandard housing is overcrowding which also has implications for health and sanitation. The question of determining what levels of room/building occupancy are or are not acceptable in any given society is extremely complex. The bureaucratic maximum quoted by Townsend, two persons per room, is a quick, but arbitrary way of establishing a national norm. More satisfactory, because it takes into account for the views of the people concerned, is the approach of Wikan who points out that "in some places, people wish to be close together and to carry on all sorts of activities in the same room. Therefore I find it more adequate to measure overcrowding in terms of the degree to which the tenants themselves feel that they fail to fulfil some of their cherished values because of lack of space".

Since there is no reliable evidence in literary sources about the occupancy levels of either insulae or domus assumptions based on archaeological remains have been made by several authorities. For example, Packer considers that the fourth and fifth floors of the Casa di via Giulio Romano were overcrowded and squalid, not only because the rooms were dark and damp, but because according to his estimate, these floors with c. 48 tenants to c. 138 m² were more densely occupied than floors one to three. The three parallel rows of cubicles on the fourth floor "are very small (c. 10 m²), but it is still entirely probable that a small family could have occupied such humble quarters". This conjecture of Frier's is possible since the smallest one-roomed shops at Ostia measure 10–12 m², but whether families lived in such cubicles in insulae is more doubtful than in the case of tabernae where child labour would make limited child rearing more profitable for a manufacturer/shopkeeper. At Pompeii some of the cellae at the gladiatorial barracks are larger (c. 10–15 m²) and only one or two gladiators slept in each room. At Rome in the ludus Magnus the rooms for gladiators were larger still at c. 20 m², twice the size of cubicles in the Capitoline insula, and with a much lower probable occupancy level. The vigiles at Ostia occupied rooms of c. 36 m² (at least on the ground floor) with approx. ten men to a room. This level of density (1 man to 3+ m²) might seem intolerable but for the fact that these rooms were dormitories for men who had washing facilities in the courtyard of their building (II, v. 1), a latrine room for all the occupants of the building, and food shops at the main entrances to the barracks. These conditions, though certainly not luxurious, were cer-

213 Brandel (above n. 190) 320.
214 See Townsend (above n. 40) 481–485.
215 Life Among the Poor in Cairo 1980, 21.
216 Above n. 29, 147.
217 Frier (above n. 18) 15.
218 G. Girri, La taberna nel quadro urbanistico e sociale di Ostia, Rome 1956, 6.
219 See above n. 37.
220 The occupancy estimate of P. K. Baillie Reynolds (above n. 38) 110–112.
tainly much better than those suffered by the tenants of the upper floors of the Capitoline insula.

A close modern equivalent to the cellae of this building is provided by the concrete seven-storey resettlement blocks hurriedly erected in Hong Kong between 1955–1961. These buildings provided 64 rooms per floor, each floor consisting of two rows of 32 rooms placed back to back. Each room is c. 10 x 12 feet (c. 13 m²) and was designed by the colonial authorities to house 5 adults (a child counting as ½ adult). Flush latrines and communal washing facilities were provided on each floor as well as stand-pipes providing mains water. Each floor was designed to accommodate 320 adults making a total of 2240 adults for an entire block. Such densities would clearly be unacceptable in the United Kingdom with its official maximum density of two people per room cited by Townsend. Such densities seem not to have been approached in any known Ostian insula complex such as the four-storey Case a Giardino (III. ix. 1–26) which perhaps housed a total of c. 946 occupants. The relatively large number of small shops with only one room and the existence in insulae of small rooms “subdivided by flimsy partitions into two or three tiny apartments”, suggest that even at Ostia crowding above the level of 2 people to one room was not infrequent in lower class dwellings.

One literary source remarks that sixteen members of the Aelian family lived in one domuncula, a term which might mean either a small domus, in which case there need not have been excessive crowding, or a home in a figurative sense in a taberna or even as an improvised shelter such as a tomb which Ulpian calls a domuncula, where crowding would have been more certain. At Rome high rents would have tended to encourage crowding on the upper floors of insulae since the financial burden might only become tolerable, if shared between a plurality of co-tenants. An unskilled worker who paid rent on a daily basis, might not be able to find employment for every day of the year, a circumstance which could cause eviction through default if he rented a room by himself. However, this consequence of temporary unemployment would not be so likely to occur when a room was shared, and a degree of privacy afforded through subdivision by means of wooden partitions.

All the well known passages from Martial and Juvenal which are often cited to attest the discomforts of poor insularii, contain no comment on crowding or lack of privacy. This is probably because these two poets never lived in the poorest type of accommodation, rather than because the Romans had low space expectations and


222 Packer, The Insulae of Imperial Ostia (above n. 65), 106.

223 Frier (above n. 18) 4; for the subdivision by partitions of cubicles in dwellings in Hong Kong, see Dwyer (above n. 222) 34, 42.

224 Valerius Maximus 4. 4. 8; cf. Tawetz (above n. 2) 504f.; R. MacMullen, Roman Social Relations, New Haven 1974, 13 (Egypt); Hopkins, Brother-Sister Marriage (above n. 1) 328f.

225 Dig. 47. 12. 3. 11.

226 Daily wage at Rome c. 1 HS 3; R. Duncan-Jones, The Economy of the Roman Empire, Cambridge 1982, 54; since the annual rent for modest accommodation at Rome in the time of Julius Caesar was 1 HS 2000 p.a., Frier (above n. 20) 30, an unskilled worker on his own would be incapable of paying this rent even if he worked every day of the year.

227 Above n. 60.
consequently were less concerned with individual privacy. Privacy was prized by high status Romans who often had isolated, quiet rooms built in their _villae_ or _domus_ where they could meditate, read, or sleep, undisturbed by the rest of the household. Seneca (Ep. 56. 1–3) vividly evokes the assorted noises he heard when living in rooms over baths, and assures his reader that such noises will not be bothersome if inner peace and tranquility has been achieved (56. 5). However, by the end of this letter, he makes it clear that the best way to deal with such noise problems is simply to leave the building and go elsewhere. Seneca was merely testing his individual tolerance of noise, and, as _proaedives_, could afford to move to quieter surroundings.

Yet Roman sensitivity to privacy is not easy to assess. Members of all socio-economic levels, from emperor to beggar congregated in the public baths where there was virtually no individual privacy. Changing rooms (apodyteria), massage rooms (distorctoria) as well as all the main bathing rooms, were totally devoid of facilities such as partitioned cubicles which are normal in the changing rooms of modern public swimming pools. At the Stabian baths at Pompeii there was a small number of individual bathrooms, but these belong to the earliest (Greek) phase of the site, and later fell into disuse after the building of the Roman baths. The general lack of privacy at the baths gave rise to annoyances such as voyeurism and worse. The infamous Hostius Quadra who enjoyed distorting mirror images of himself being debauched, is reported to have scoured the baths for men with large genitals. That this was not an isolated case is shown by several other sources. Also the sick and the deformed might be ridiculed at the baths for their physical defects. Martial, for example, Pillories a man who derided hernia patients at the baths, till he suffered from the same complaint himself (12. 83). Trimalchio's sentiment, _nihil melius esse quam sine turba lavari_ (73. 2) which he utter in his own baths, would perhaps have been shared by other Romans if they were privileged enough to possess baths in their own houses.

Privacy is also felt to be a normal necessity in modern Western societies, both for defecation and sexual intercourse ('sex/elimination amalgam'). No extant Roman author gives his impression of a Roman _forica_ where as many as sixty or more people, men and women, sitting on stone or wooden seats, relieved themselves in full view of each other. One surviving piece of evidence from Suetonius depicts the poet Lucan recting a verse by Nero while relieving himself in a public latrine. The other occupants

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228 Pliny, Ep. 2. 17. 22 and 24; cf. Ep. 9. 38. 1; Seneca, Ep. 80. 1; Augustus retired to his "Syracuse" for peace and quiet (Suet., DA 72. 2); Hadrian's Teatro Marittimo in his villa complex at Tivoli was "a sort of private study where the emperor might retire to work or meditate undisturbed"; N. Neurberg, Some Considerations of the Architecture of the Imperial Villa at Piazza Armerina, in: Marayna 8 (1959), 28.

229 _non aliquando commodius est et carere convicio?_ fateor. itaque ego ex hoc loco migrabo. _experiri et exserere me volui_ (Ep. 56. 15).


231 In period I there were 4 such individual cubicles, see Eschebach (above n. 207) Taf. 34.

232 Seneca, Quaest. Nat. 1. 16. 3.

233 References (Quadra excepted) collected by Howell (above n. 86) on Mart. 1. 22.


235 De poetis 31 (p. 147 Rostagni) _adeo ut quandam in latrinis publicis clarior cum crepitu ventri hemischiium Neronis magna consessorum fuga pronuntiari: sub terris tonsiuseque gutae_.

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tities of such rooms, but a combination of uncontrolled rents, which might have caused malnutrition as a byproduct, and the total lack of legislation enforcing minimum occupation densities in multiple dwellings, are likely to have created congested living conditions. A further lack of enforceable regulations to ensure adequate light, ventilation, water supply, and waste disposal, in combination with unsatisfactory street cleaning would also have created an extremely unhealthy environment for those who had no choice but to live in the concrete cubicles of the Capitoline insula. To what extent cohesive family units could survive under such circumstances is difficult to estimate. Adults and children would lack separate rooms and probably even separate beds, a situation which in Hong Kong causes hotels and motels to rent rooms by the hour “not for illicit liaisons, but so that married couples can briefly share a bed away from their teenage children”. Children who survived childbirth, and were not exposed, would have no recreation space on the fourth floor of this building except for the damp, totally unlit rear corridor. Roman children used to play at being gladiators. In these circumstances they would only be able to play at being andabatae who fought each other while wearing visors with eye holes. So children would probably play in the streets, especially as they would not spend any time at schools which their parents could not afford.

To suggest with MacMullen that such atrocious conditions at home were “made tolerable by the attractive spaciousness of public facilities” would probably strike a Roman on an erratic daily wage of c. HS 3 with a dependent family, as a cynical acceptance of the state’s indifference to the lot of the urban poor. If an unskilled worker was by the very nature of his housing denied privacy for the most fundamental life functions, if he could never be sure of adequate food and clothing, and if he lacked resources to gain access to formal education and the protection of the law, what compensation would he be likely to derive from costly public buildings which reflected the maestas imperii, or from a few public parks? The condition of the urban poor and indigent in the Roman world must have been aggravated by a consciousness of their own hopelessness made all too obvious by the wealth of high status Romans who in the most conspicuous manner displayed their riches which the state did not try to redistribute to minimize the disequilibrium between rich and poor. Levishly ornamented public baths, temples, and amphitheatres no doubt produced in the

244 Cf. A. L. Schorr, How the Poor are Housed, in: L. A. Freeman—J. L. Kornbluh—A. Haber (edd.), Poverty in America, Ann Arbor 1988, 351 who shows how high rents can cause the poor to feed and clothe themselves inadequately.
246 Baladon (above n. 148) 92.
248 For architecture as a reflection of maestas imperii (Vitr. 1 præf. 1, 2), see H. Derrup, Architektur als Symbol, in: Gymnasium 73 [1966], 181—197 (esp. p. 183); cf. G. B. Gigliani, Lavori pubblici e occupazioni nell’antichità classica, Bologna 1977, 189. There were numerous fori in Rome. Platner—Ashby (above n. 80) list a total of 87 on 264—278; most of them were privately owned and situated in high status areas of the city such as the Pincian and Esquiline; some temple enclosures appear to have had gardens, see R. B. Lloyd, Three Monumental Gardens on the Marble Plan, in: AIA 86 [1982], 91—100.
249 K. Hopkins, Taxes and Trade in the Roman Empire, in: JRS 70 [1980], 121f.
250 Cf. M. Marvin, Freestanding Sculptures from the Baths of Caracalla, in: AJA 87 [1983],
poor a momentary forgetfulness of fatid, cramped, living quarters, but could hardly
be considered as genuine substitutes for what must justifiably be called slums.

Life for the poor in Rome’s high rise tenements was dangerous not merely because
of the constant risks of fire, collapse, and the rapid spread of communicable diseases
in overcrowded badly ventilated rooms, but also because such conditions frequently
produce a high level of violence and crime. The atrium-type house provided the
wealthy with a very private environment which was also relatively secure from
burglary. Windows in outer walls on ground floors were usually small, placed high
above the road, and frequently protected by spiked iron grilles (fenestrae clatratae).

Close to the vestibule a doorman (ostiarius), sometimes chained to the wall of his
cella, kept an eye on those who entered, and guard-dogs, also sometimes chained,
were regularly on the premises. Impluvia were also sometimes protected by iron
grilles to prevent burglars from entering the atrium via the roof. In the interior of
the building was a strongroom (herœrum) where the owner’s valuables were
safeguarded. In addition, the rich hired their own private security guards (salarii).

In Roman towns the rich were as security conscious as their counterparts in towns of
the developing world where a vast gulf separates the advantaged from the disadvan-
taged. For example, a typical rich residence in Costa Rica has “a high cement wall,
crowned with broken glass to discourage burglars”, and newer residences “may have
grille-covered windows, burglar alarms, and a watchdog or two, plus a neighbourhood
private guard service—an old Spanish tradition”. Though the rich would be the
most desirable targets of burglars, the defences of their inward looking fortress-like
residences would be difficult to penetrate. It seems from passages in the Digest that
in towns burglary was more frequent in insulae and public herœa. The public baths
were also frequently visited by thieves who were sometimes the very people hired by bathers
to guard their clothes.

347: “For a few hours of every day, the urban poor could feel rich, could enjoy, not just
the activities, but the luxurious surroundings available to the privacy of their villas to
the rich.”

24. For a survey of window types, see V. Spinazzolo, Pompei alla luce degli scavi nuovi di:
via dell’Abbondanza (1910–1923) vol. 1, Rome 1933, 65–66; G. Webster, Roman Windows
24. Ovid, Am. 1. 6. 1; Suet., de clar. rh. 3.
25. A dog chained to a stake was found in the atrium of the House of Vesuvius Primus at Pomp-
iei; R. Brilliant, Pompeii AD 79, New York 1976, 129; Sen., de ira 3. 37. 2; Petr.,
Satyr. 72. 7.
Severus (SJA 39. 3) provided herœa in all regions of Rome for the benefit of those who
could not provide themselves with privata custodiae; cf. also the private herœ in
Apuleius, Met. 3. 22; 4. 18; 5. 2.
30. A brigand in Apuleius, Met. 4. 9 says the houses of the rich are easier to penetrate, since,
though the familia of the residence may be large, everyone is interested in their own
wellfare, and not in that of the dominus.
31. Paulus, Dig. 1. 15. 3. 2 e fracturas fiant piersque in insula in herœaque; cf. Ulpian,
Dig. 47. 11. 7 on the activities of sacularis | directari qui in alia cosa culva se dirigunt
furandi animo; id., Dig. 48. 8. 10 ei quic dolo insulam meam exuserit.
32. Caparsa; Dig. 1. 15. 3. 5; thieving from the baths and stealing from the houses of old
women are regarded as dishonourable by brigands in Apuleius, Met. 4. 8; the fur was a
standard feature of the bathers; Seneca, Ep. 50. 2.
Low status insularii were exposed to official and unofficial violence in their dwellings. If they lit a brazier in their home to heat themselves or cook food, they risked being clubbed or flogged on the authority of the praefectus vigilum. Also high levels of violence are commonly associated with high density living. Studies conducted by several sociologists show that one main area of fear experienced by slum-dwellers concerned the ever present risks of theft and violent physical assaults. These risks in addition to the non-human threats in their environment such as poor plumbing (in the case of insularii, non-existent) and the consequential smells, combine to give such tenants a sense of being moral outcasts.

The insularius who tried to escape the anxieties created by his living conditions by going into the streets would find little relief. The casual statement made by Suetonius that Augustus derived special pleasure from watching groups of people brawling in narrow city streets reveals a great deal not only about the emperor’s personal tastes in entertainment, but also about the official tolerance of disorder in the streets which were in any case very congested, if Juvenal’s picture of them in Satire 3. 225–261 is not exaggerated. At night the streets were less congested, but dangers of a different kind lay in store for the solitary pedestrian, including mugging and being struck by rubbish and wastes thrown from the windows of insularii. The Digest sometimes provides pictures of lower class Roman life as vivid, and perhaps more trustworthy, as any given by Juvenal. One such vignette is of a Roman street scene at night. A tabernarius puts his lantern on the pavement. A passerby makes off with the light with the shopkeeper in pursuit. The thief strikes him with a lash (flagellum) and a brawl ensues which ends when the shopkeeper knocks out one of the thief’s eyes. Such street violence was probably commonplace at Rome, but is only reported by historians where it takes place on a scale large enough to have serious political implications.

High density living in insanitary urban dwellings and surroundings can have only one major consequence in a preindustrial society which lacks effective and cheap medical care: a short, often violent, life. That this was the common lot of the millions of people in the Roman world who lived on or below subsistence level, can hardly be doubted, given the conditions discussed above.

258 Ulpian, Dig. 1. 15. 4 insularios et eos qui neglegenter ignes apud se habuerint, potes justibus vel flagellio conditi subes.
260 CA 45. 2 cæterarios oppidanos inter angustias vicorum pugnantes tenere ac sine arte.
261 In depiction of the dangers to the pedestrian from waggoned loaded with building materials (3. 254–264) is confirmed by Alfenus, Dig. 8. 2. 32. 2 where a runaway waggun on the clitus Capitoletinus is described as having crushed a young slave; another case follows (9. 2. 32. 3) in which a slave is gored by a bull; cf. Ulpian 9. 2. 27. 33 for building materials falling off waggon.