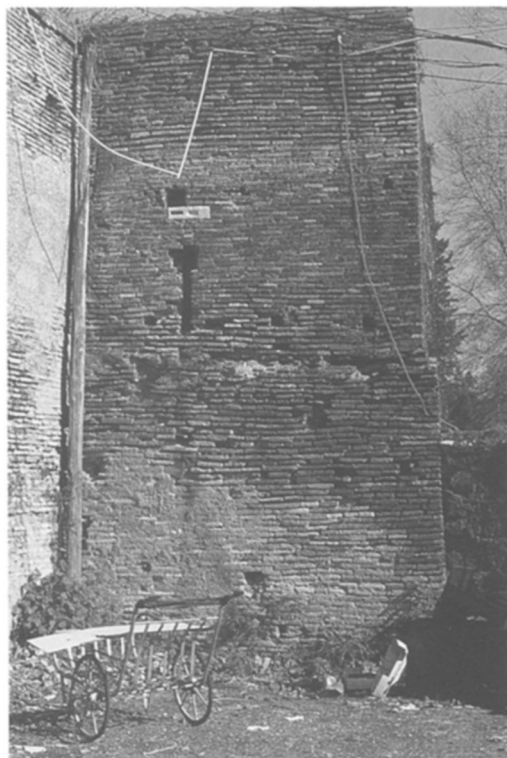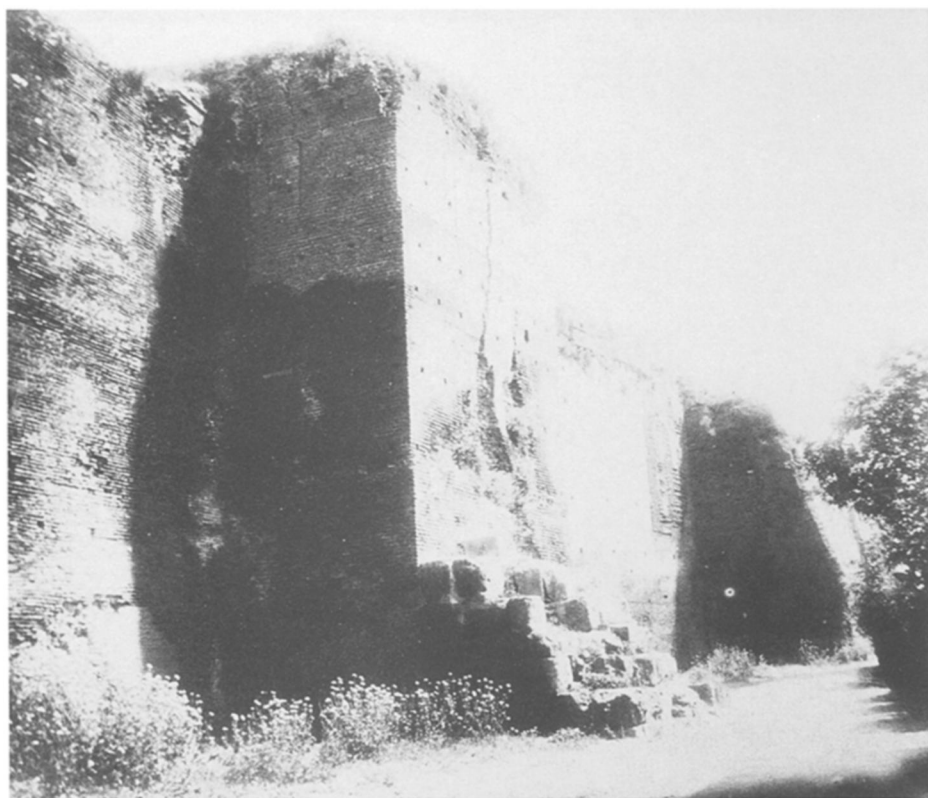1. SECOND TOWER EAST OF PORTA METRONIA: MASONRY OF
RE-USED *OPUS QUADRATUM* AND BRICK.

2 SAN MARTINO AI MONTI. EXTERNAL RIGHT AISLE WALL: MASONRY OF RE-USED *OPUS QUADRATUM* AND BRICK.

1. FIFTH TOWER WEST OF VIA ZABAGLIA, REBUILT IN
RE-USED BRICK.

2. SEVENTH TOWER WEST OF PORTA ASINARIA IN 1864–66 (PARKER PHOTOGRAPH 42).

1. AQUA CLAUDIA AT CAPANNELLE. PATCHING IN RE-USED BRICK.

2. AQUA CLAUDIA AT PORTA FURBA. BUTTRESS IN RE-USED BRICK AND TUFA BLOCKS.

1. AQUA CLAUDIA IN THE VILLA WOLKONSKY. SUSTAINING ARCH IN RE-USED BRICK.

2. AQUA ALEXANDRINA AT TOR TRE TESTE. ARCADE REBUILT IN RE-USED BRICK.

THE WALLS AND AQUEDUCTS OF ROME IN THE EARLY MIDDLE AGES, A.D. 500–1000*

By ROBERT COATES-STEPHENS

(Plates XV–XVIII)

I. INTRODUCTION

Our knowledge of the city of Rome after the fall of the Western Empire is largely determined by its position as the seat of the Papacy. Historical studies are based principally upon the *Liber Pontificalis* and the writings of the popes themselves, while architectural and archaeological research has concentrated on the city's numerous churches, many of which for the period A.D. 500–850 are remarkably well-preserved. The best known modern syntheses in English from each field are probably Peter Llewellyn's *Rome in the Dark Ages* (1971) and Richard Krautheimer's *Rome. Profile of a City* (1980). If we look beyond the purely ecclesiastical, however, we find very little. Archaeological studies of Rome's urban infrastructure—walls, roads, bridges, aqueducts, sewers, housing—tend to stop, at the latest, with the Gothic Wars of the mid-sixth century. The lack of research, and therefore lack of data, have in turn been interpreted as a sign that early medieval Rome was a city bereft of an artificial water-supply, and of the resources necessary to maintain such structures as the Aurelianic Walls. Studies of medieval urbanism have been affected by this dearth of evidence, proposing, for example, settlement models with the population of the city crowded into the Tiber bend in order to obtain water.[1]

Llewellyn's evocation of the urban landscape of Rome at the time of Gregory the Great, bleak as it may be, is by no means the most pessimistic portrait:

> In former days of peace, a large and complex organization had maintained [the aqueducts], the drainage of the city and the retaining walls of the Tiber banks; that organization had now vanished. Of the aqueducts, only the Aqua Virgo, which for much of its course ran underground, could now be relied upon. . . and now its line determined the settlement of Rome's population. The others, patchily repaired after being frequently cut, and improperly maintained, leaked and formed marshes under their junctions; the drainage of low-lying parts of the city also became imperfect through neglect, and unrepaired embankments to the river allowed floods to overflow the streets. All these interruptions to the normal servicing that had hitherto kept them in good repair, and the insufficient resources to make good the damage, allowed the city to become a wetter, more unhealthy place. . . Rome became ever more at the mercy of the elements and its citizens had less control over their environment. (op. cit., 97)

[1] The standard monograph on the walls remains Ian Richmond, *The City Wall of Imperial Rome* (1930), whose lack of interest for post-classical phases has been criticized by L. Pani Ermini, ' "Renovatio murorum" tra programma urbanistico e restauro conservativo: Roma e il ducato romano', *SCIAM* 39 (1992),

496. The chief studies of the aqueducts are R. Lanciani, *I commentarii di Frontino intorno le acque e gli acquedotti* (1890), E. Van Deman, *The Building of the Roman Aqueducts* (1934), and T. Ashby, *The Aqueducts of Ancient Rome* (1935); B. Ward-Perkins has remarked on a similar absence of data here regarding the early medieval phases (*From Classical Antiquity to the Middle Ages* (1984), 153). For settlement patterns characterized by concentration within the Tiber bend see: R. Krautheimer, *Rome. Profile of a City* (1980), 56; M. Laurenti, 'Via Lata. Edifici imperiali lungo via del Corso', *BA* 16–18 (1992), 165; O. Gilkes, S. Passigli and R. Schinke, 'Porta Pia: excavation and survey in an area of suburban Rome, Part 2', *PBSR* 62 (1994), 130; H. Evans, *Water Distribution in Ancient Rome* (1994), 146.

Although this is the picture which tends to stick in the mind when early medieval Rome is imagined, we do know from the texts that not only the aqueducts, but also the city walls (and even the Tiber embankments) were subsequently repaired, apparently on a very large scale. This article represents an initial archaeological survey of these substantial post-classical reconstructions of the Aurelianic Walls, the Aqua Claudia-Anio Novus, and the aqueduct known as the Alexandrina. Together, they reveal the considerable continuity of the city's ancient urban infrastructure during the early Middle Ages.

II. THE AURELIANIC WALLS

The textual evidence for the rebuilding of the walls is extensive. The original circuit was carried to completion under Honorius and Arcadius in 402–3. Thereafter, the first principal intervention recorded was that of Theoderic, known from Cassiodorus, the Anonymous Valesianus, and Isidore of Seville. This rebuilding, perhaps made necessary by the earthquake of 502, formed a part of the general revival of public works in Italy under the Ostrogothic government. As they had been during the Late Empire, building projects in Rome were financed from the *arca vinaria*, and the *annona*.[2]

The restoration of the walls, and the damage caused to them, during the Gothic Wars is well-documented by Procopius, who gives an eyewitness-account (at least for the first siege). On his arrival in the city in December 536, Belisarius overhauled the defences in preparation for the siege: he dug a ditch around the circuit, fitted anti-siege machinery, and rebuilt the merlons. Ten years later, Rome was taken by Totila: Procopius claims that in an attempt to make the city useless to the Byzantines, the Goths destroyed a third of the circuit, which was subsequently repaired by Belisarius in only twenty-five days, with no mortar (this will be considered in more detail below). Further, more permanent repairs were undertaken both by the Goths themselves after Totila's second siege (this according to Procopius), and in all probability by the post-war administration under Narses: we know from Justinian's Pragmatic Sanction of 554, which laid down the legal framework for the Byzantine government of Italy, that Rome's public buildings were to be maintained from the usual public funds—and a number of other texts refer in general terms to the rebuilding of Rome and other cities by Narses in the twelve years following the reconquest.[3]

The most substantial restorations of the walls in the early medieval period were carried out by the eighth- and ninth-century popes in response to the threat of Lombard and Arab invasions of the Duchy of Rome. The first campaign, described by the *Liber Pontificalis*, was carried out by Popes Sisinnius, Gregory II, and Gregory III, between

---

[2] Cassiodorus, *Var.* 1.25, 28 and 2.34, and the Anonymous Valesianus 67 both speak slightly ambiguously of 'moenia', although Isidore, *Hist. Goth.* (annus 513), is more precise: 'muros namque eius iste redintegravit'. A lost inscription records a restoration of the Porta S. Petri by Pope Symmachus at this time: 'Antistes portam renovavit Simmacus istam / ut Rome per eum nichil esse non renovatum'— A. Silvagni, 'La silloge epigrafica di Cambridge', *RAC* 20 (1943), 97. For the sources of funding, see additionally: Cassiodorus, *Var.* 12.18 and A. Chastagnol, *La Préfecture urbaine à Rome sous le Bas-Empire* (1960), 341.

[3] Restorations during the wars: Procopius, *BG.* 1.14, 21 and 3.24, and, in less detail, *Chron.Marc.* MGH CM II, 108 ('Totila... muros evertit... sic veniens Belisarius murorum partem restaurat.') and

LibPont 60.4 ('Ingressus autem Vilisarius. . . custodiis et monitionibus vel fabricis murorum aut reparationem fossati circumdedit civitatem Romanam et munivit.'). After the wars: Pragmatic Sanction, 25: 'Consuetudines etiam et privilegia romanae civitatis vel publicarum fabricarum reparationi vel alveo Tiberino vel foro aut portui Romano sive reparationi formarum concessa servari praecipimus, ita videlicet, ut ex isdem tantummodo titulis, ex quibus delegata fuerunt, praestentur.' (*Corpus Iuris Civilis, Novellae*, app. VII, 25). A number of texts refer to Narses' work to restore the towns and 'moenia' of Italy (*AuctHann-Extr* 1.4), the churches (Paul Deacon 2.3), and even the Palatine in Rome (*ExcSangallensia* in MGH CM II, 336; Agnellus 95). *CIL* VI.1199 records his rebuilding of the Ponte Salario, destroyed by the Goths.

708 and 740 (89.2, 91.2, 92.15).[4] Up to now, this work has interested historians chiefly because it represents the first blatant assumption by the papacy of the former Byzantine, imperial control over public building. At least in theory, such work should have been carried out by the civil administration, with any role played by the popes authorized by the emperor. Instead, the *Liber Pontificalis* tells us that Gregory II 'issued a decree to restore this city's walls. He ordered the burning of lime, and commenced work at Saint Lawrence's portico' (i.e., the Porta Tiburtina). Gregory III is stated to have paid for the workers' rations and the materials from his own funds. After this work, in 756, the circuit was able to withstand the three-month siege of Aistulf, during which siege engines were used by the Lombards (*Codex Carolinus* 8–9).

At the end of the eighth century, Pope Hadrian I carried out two campaigns of rebuilding, spending according to the *Liber Pontificalis* 100 lbs of gold on materials and on wages and rations for the workforce, which was raised from Rome itself, the suburbs, and 'all the cities of Tuscia and Campania'—a substantial project, in other words (97.52 and 92). The final rebuilding of the early Middle Ages was undertaken by Leo IV, following the Arab raid on Rome and looting of Saint Peter's basilica in 846. The most notable reaction to this catastrophe, of course, was the construction of a new defensive circuit around the Vatican, the Leonine Walls, built between 848 and 852. As well as a general restoration of the Aurelianic circuit, Leo built a tower on each side of the Tiber near the Porta Portuensis, from which was suspended a chain to prevent further river-borne attacks (*LibPont* 105.38–40). The well-known description of the walls inserted in the Einsiedeln 326 manuscript represents what Richmond termed 'an inventory of the architectural features of the Wall compiled when the Wall was in much need of repair'.[5] It lists the total numbers of towers, merlons, latrines, and large and small, outward-facing windows.[6] The proportions of each are wildly different for each stretch of the circuit, hence Richmond's comment that the list was made when the walls were in a ruinous state. The description can be dated in origin to a period after the Gothic Wars and before the end of the ninth century, and is generally believed to represent a survey drawn up precisely for one of the restorations of Hadrian I or Leo IV. And the detailed description of Leo's restoration given by the *Liber Pontificalis* does in fact suggest that a very thorough survey, of the kind represented by the Einsiedeln manuscript, was carried out prior to work commencing. It is also the only textual account of a restoration which, like the Einsiedeln description, actually speaks individually of walls, gates and towers—even enumerating the latter. To quote from Raymond Davis' translation:

> The blessed prelate Leo IV began with the consultation of the Lord Jesus Christ to treat of the condition of the city of Rome and the restoration of the walls. . . he ordered not only the walls to be made with speed and agility, but he also bade that the gates with which the whole city is closed be quickly rebuilt to a new standard and with very strong timbers. So that all these things might be brought to completion and rendered beautiful, this apostolic man bustled about with his loyal men without discrimination, not simply staying at ground level but even going on his own feet along the walls and gates, so that in their restoration there might arise no hesitation or delay. And he ordered fifteen towers which he found utterly destroyed round the circuit of the city to be restored from the ground up.[7]

Up to now, the archaeological investigation of these phases has been characterized by Richmond's comments:

> The repairs on the wall drop to their lowest level after this time [the Gothic Wars] and become quite indistinguishable from one another for the historian's purpose. The old tradition of building had disappeared and in its place comes the botching associated with

---

[4] Over a century earlier Pope Gregory I had helped the Byzantine authorities to organize the city's defence during the first wave of Lombard invasions, although his letters make no reference to any building work (*Reg* 2.45, 5.36, 9.240). However, considering that a description of the walls, usually dated to the late seventh century, excludes the Porta Chiusa, Ardeat-ina, and either the Labicana or Praenestina from its list of gates, we might assume that these were blocked up during the siege of 592–3 (R. Valentini and G.

Zucchetti, *Codice topografico della città di Roma,* vols 1–5 (1940–53), 2.141–53).

[5] Richmond, op. cit. (n. 1), 49.

[6] For example: 'A porta Metrovia usque Latinam: turres xx, propugnacula ccxciiii, necessariae xvii, fenestrae maiores forinsecus c, minores clxxxiii' (Valentini and Zucchetti, op. cit. (n. 4), 2, 202–7).

[7] R. Davis, *The Lives of the Ninth-century Popes* (1995), 126.

unskilled labour of any age, and only resembling earlier work by its use of older materials in the most indiscriminate way... from such material as this it would be vain to attempt the extraction of historical facts.[8]

Richmond finished his archaeological analysis with the remains of what he believed to be the repairs of Belisarius, described by Procopius. These comprise many towers and curtain walls restored with huge, re-used tufa blocks (Pl. XV, 1). Procopius claimed that Totila's troops started to carry out the King's threat to raze the entire city of Rome by destroying 'a third' of the Aurelianic Wall. When Belisarius re-occupied the city, his own soldiers repaired the damage in twenty-five days using 'the nearest stones to hand', with no mortar, the whole reinforced with a timber palisade. Richmond interpreted this to mean that the Goths had merely undermined one third of the thickness of the wall in certain parts of the circuit, and that this was then made good by the Byzantines with the blocks we see today: he claimed that they always occur at ground-level, and that any brick-and-mortar filling was carried out during later campaigns.[9] As we see from Pl. XV, 1, this cannot be true.

Plate XV, 1 shows the second tower east of Porta Metronia, which is still attributed to Belisarius. Although no one would claim that it displays the kind of *opus quadratum* techniques of, say, the Augustan age, it is hard to associate this with the hurried reinforcement of a collapsed tower, using only the nearest stones to hand, and no mortar. Despite their varying sizes, the blocks have been re-laid, with mortar, in almost regular courses, each about 60 cm high: where necessary, fragments of brick have been used at the base of each course to level off the tops of the blocks. The last course of blocks, in fact, rests on a band of brickwork five courses high: there is no way that either the bricks or mortar could have been added later, as Richmond claimed. Neither does this reconstruction amount simply to the reinforcement of the base of the tower, nor only to its outer thickness. The section built in blocks is 4.64 m high, and taking into account the extra four courses buried since Parker's photograph 43 of around 1870, the blocks were originally used up to a height of 7 m. An examination of the inside of the tower reveals that the blocks are used throughout the thickness of the walls—that it is, in short, an *ex novo* work. These characteristics—the use of blocks to a great height, in conjunction with bricks and mortar, and reconstruction as new, from the ground up— are found in all of the examples attributed by, and since, Richmond, to the sixth century.

Whilst they cannot be assigned to Procopius' description of Belisarius' works, it can in fact be shown that these examples belong instead to the eighth- and ninth-century papal campaigns summarized earlier. The technique of re-using *opus quadratum* tufa blocks in conjunction with re-used bricks, the latter laid in notably undulating courses, has, since Richmond's day, been demonstrated to belong assuredly to the period from about 750 to 850.[10] Well-dated churches in Rome from this period show the same construction techniques found here in the Aurelianic Walls. It remains difficult, however, to differentiate between the masonry types of buildings erected by Hadrian I, such as Santa Maria in Cosmedin, and those of Leo IV, such as San Martino ai Monti (Pl. XV, 2). We can none the less assign each example of similar masonry encountered in the Aurelianic Walls to one of these popes' interventions. This includes not only the stretches reconstructed in re-used *opus quadratum* blocks, but also other towers and curtain walls built only in brick—but poorly-coursed, sometimes wildly-undulating brick *spolia* (Pl. XVI, 1). In total, sixteen surviving towers, six curtain walls, and much

[8] Richmond, op. cit. (n. 1), 267.
[9] Richmond, op. cit. (n. 1), 41–3.
[10] Such dating is proved throughout Richard Krautheimer's five-volume analysis of the early churches of Rome, *Corpus Basilicarum Christianarum Romae* (1937–77); a straightforward study of the same buildings' masonry techniques is provided by G. Bertelli, A. Guiglia Guidobaldi and P. Rovigatti Spagnoletti,

'Le strutture murarie degli edifici religiosi di Roma dal VI secolo al IX secolo', *RIA* 23–4 (1976–7), 95–173. S. Gibson and B. Ward-Perkins note the same eighth- or ninth-century techniques in the earliest phases of the Leonine Walls: 'The surviving remains of the Leonine Wall', *PBSR* 47 (1979), 30–57 (Part 2 in *PBSR* 51 (1983), 222–40).
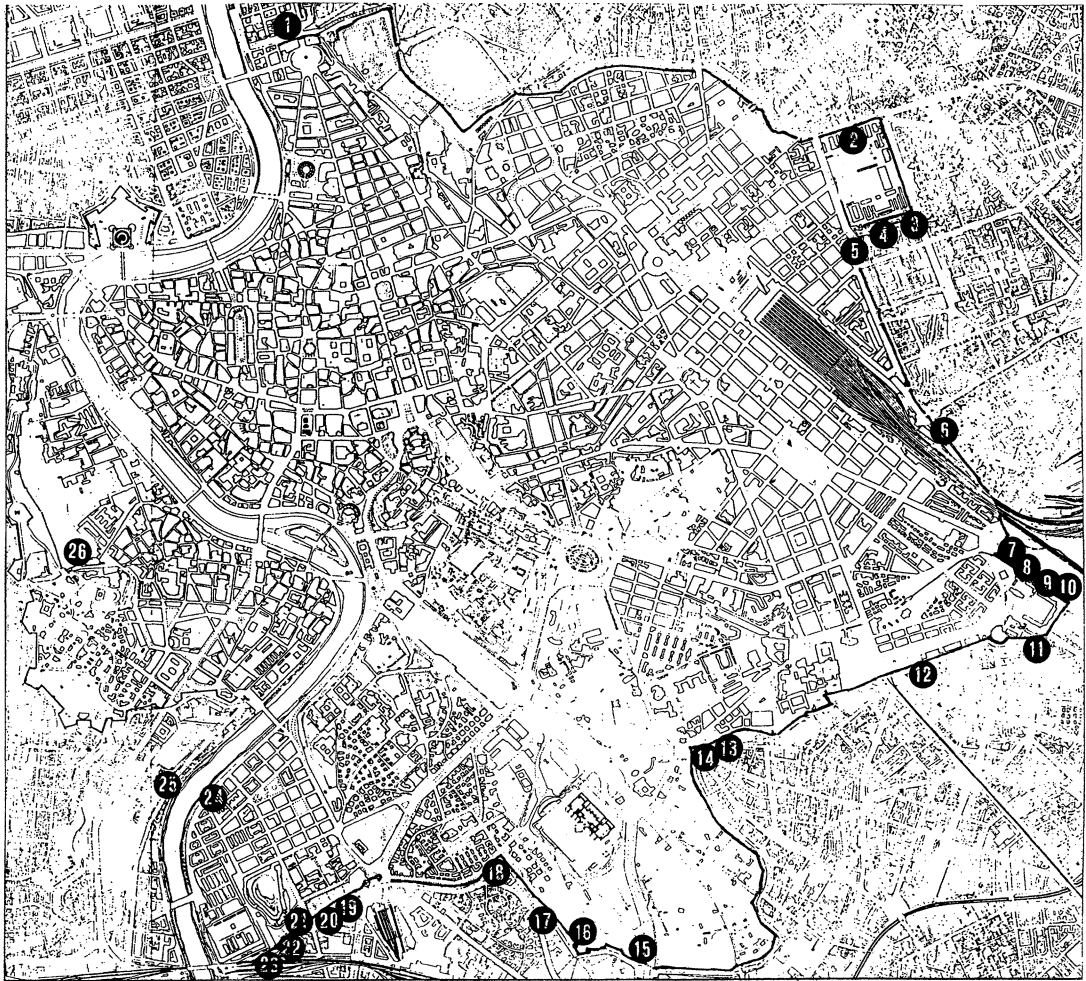
FIG. 1.   PLAN OF MODERN ROME, SHOWING THE EIGHTH- AND NINTH-CENTURY RECONSTRUCTIONS OF THE AURELIANIC
WALLS.
    1. FIRST TOWER WEST OF PORTA FLAMINIA: ENTIRELY REBUILT IN RE-USED BRICK. 2. CASTRO PRETORIO, 150 M EAST
OF VIALE CASTRO PRETORIO: INTERNAL PATCHING IN RE-USED BRICK. 3. CASTRO PRETORIO, SOUTH WALL: EXTERNAL
REFACING IN RE-USED BRICK. 4. CASTRO PRETORIO, SOUTH WALL: ENTIRELY REBUILT IN RE-USED *OPUS QUADRATUM*. 5.
THIRTIETH TOWER SOUTH OF PORTA NOMENTANA (NOW VANISHED): CURTAIN ENTIRELY REBUILT IN RE-USED *OPUS
QUADRATUM* AFTER COLLAPSE OF TOWER (PARKER, PHOTOGRAPHS 965–6). 6. SIXTH TOWER SOUTH OF PORTA TIBURTINA:
UPPER PORTION REBUILT IN RE-USED BRICK. 7. SECOND TOWER SOUTH OF VIA ELENIANA: ENTIRELY REBUILT IN RE-USED
BRICK. 8. THIRD CURTAIN WALL SOUTH OF VIA ELENIANA: EXTERIOR REBUILT IN RE-USED BRICK AND *OPUS QUADRATUM*. 9.
FOURTH TOWER SOUTH OF VIA ELENIANA: LOWER PORTION REBUILT IN RE-USED BRICK. 10. FIFTH CURTAIN WALL SOUTH OF
VIA ELENIANA: EXTERIOR REBUILT IN RE-USED BRICK AND *OPUS QUADRATUM*. 11. THIRTEENTH TOWER WEST OF VIA
CASILINA: BASE REBUILT IN RE-USED *OPUS QUADRATUM*. 12. SIXTH TOWER EAST OF PIAZZALE APPIO: ENTIRELY REBUILT IN
RE-USED BRICK. 13. FOURTH TOWER EAST OF PORTA METRONIA: ENTIRELY REBUILT IN RE-USED BRICK. 14. SECOND TOWER
EAST OF PORTA METRONIA: ENTIRELY REBUILT IN RE-USED BRICK AND *OPUS QUADRATUM*. 15. FIRST CURTAIN WALL WEST OF
VIA C. COLOMBO: INTERIOR PATCHED IN RE-USED BRICK. 16. FIRST TOWER WEST OF BASTION OF SANGALLO: ENTIRELY
REBUILT IN RE-USED BRICK AND *OPUS QUADRATUM*. 17. SEVENTH CURTAIN WALL EAST OF VIA GUERRIERI: EXTERIOR REBUILT
IN RE-USED *OPUS QUADRATUM*. 18. FOURTH TOWER EAST OF VIA GUERRIERI: CURTAIN WALL REBUILT IN RE-USED *OPUS
QUADRATUM* AFTER COLLAPSE OF TOWER. 19. SECOND TOWER EAST OF VIA ZABAGLIA: BASE REBUILT IN RE-USED BRICK. 20.
FIRST TOWER EAST OF VIA ZABAGLIA: ENTIRELY REBUILT IN RE-USED BRICK AND *OPUS QUADRATUM*. 21. FIRST TOWER WEST
OF VIA ZABAGLIA: REAR REBUILT IN RE-USED BRICK AND *OPUS QUADRATUM*. 22. THIRD CURTAIN WALL WEST OF VIA
ZABAGLIA: REBUILT IN RE-USED *OPUS QUADRATUM*. 23. FIFTH TOWER WEST OF VIA ZABAGLIA: ENTIRELY REBUILT IN RE-
USED BRICK. 24. RIVER WALL BETWEEN VIA FLORIO AND VIA B. FRANKLIN: REBUILDING OF LEO IV (*BCAR* 1936, 70). 25.
MIDWAY BETWEEN THE TIBER AND THE PORTA PORTUENSIS: REBUILDING OF LEO IV IN RE-USED BRICK (*BCAR* 1892, 287).
  26. SEVENTEENTH TOWER WEST OF PONS AGRIPPAE: REBUILT IN RE-USED *OPUS QUADRATUM* (PARKER, PHOTOGRAPH 949).

of the southern portion of the Castro Pretorio can be attributed to the late eighth- and mid-ninth-century rebuilding campaigns described by the *Liber Pontificalis* (Fig. 1).[11]

Some light might be cast on the earlier restoration of Belisarius by two nineteenth-century illustrations of a tower beneath the Lateran. Pl. XVI, 2 shows Parker's photograph 42 of 1864–6, and the same tower also appears in a print by William Gell (pl. XX of A. Nibby's *Le Mura di Roma* (1821)).[12] The base of the tower has been reinforced with a disordered pile of *opus quadratum* blocks, presumably following some damage which caused the large vertical crack visible in the centre. No mortar has been used. Richmond claimed, in 1930, that many similar examples of such indiscriminate piles of blocks, placed only at the foot of certain towers, had been dismantled 'in recent years'.[13] Such work seems to conform well to Procopius' description of the twenty-five-day repairs carried out by the Byzantine soldiers. Those towers rebuilt in the eighth and ninth centuries which utilised similar blocks may well therefore represent a second phase of reconstruction carried out on the same towers which had been repaired temporarily in the sixth century.

Any evidence for the restoration of Theoderic remains elusive. Richmond has recorded the sparse information concerning bricks bearing either Theoderic's or Athalaric's stamps found during past restorations or demolitions of the walls.[14] In the absence of detailed descriptions of their context, however, they can serve as nothing more than a *terminus post quem* for medieval or even modern interventions. The minute examination of the standing stratigraphy of the walls might reveal stretches of rebuilding which are demonstrably later than the brickwork of Honorius and Arcadius, and at the same time earlier than the eighth- or ninth-century work considered here, and could therefore plausibly be assigned to Theoderic's rebuilding campaign.[15]

III. THE AQUEDUCTS

Procopius tells us that the channels of all the aqueducts were cut by Vitigis in early 537. At the same time, Belisarius had the conduits giving access through the city walls blocked with masonry for a considerable distance (*BG* 1.19). Neither of these actions would have caused fundamental, structural damage to the water-supply, and we know from a letter of Gregory the Great, sixty years later, that the aqueducts were working again in 602 (*Reg.* 12.6). However, we have no references after the Gothic Wars to the continued use of any of the great public baths in the city. It seems certain that during the early Middle Ages the water-supply was used chiefly for the city's mills and church amenities such as baptisteries, latrines, and fountains. There are textual references throughout the period to all of these being supplied specifically by the aqueducts, and, in addition, we hear of baths at the Lateran Patriarchate, the Vatican, and a number of other ecclesiastical complexes. The usual biases of our ecclesiastical sources may go some way to explaining why the aqueducts are never explicitly referred to in relation to the supply of drinking-water. Frontinus' system of *munera* and *lacus* may have survived (and a reference by Flodoard of Rheims seems to confirm the upkeep of fountain-basins—see n. 31, below), although we have no certain proof of this. At present our

---

[11] The lack of more precision in dating such characteristic masonry means that we cannot rule out absolutely the possibility that one or two examples here might even be attributed to the early eighth-century work of Gregory II and Gregory III (we know, for example, that the former commenced work at the Porta Tiburtina; example 6 of Fig. 1 could therefore belong to him). The question awaits more study of the buildings of Rome's so-called 'dark age' of 640–750.

[12] The tower is identified by A. Colini as the seventh to the west of Porta Asinaria; the blocks had been buried by his time (*Storia e topografia del Celio nell' antichità* (1944), 126).

[13] Richmond, op. cit. (n. 1), 267.

[14] Richmond, op. cit. (n. 1), 37–8.

[15] Lucos Cozza, the foremost scholar of the monument, has detected such patching in the north wall of the Castro Pretorio, where he believes the effects of ancient subsidence, perhaps caused by an earthquake, were made good in re-used brick of high modulus ('Mura di Roma dalla Porta Nomentana alla Tiburtina', *Analecta Romana Instituti Danici* 25 (1997), 36).
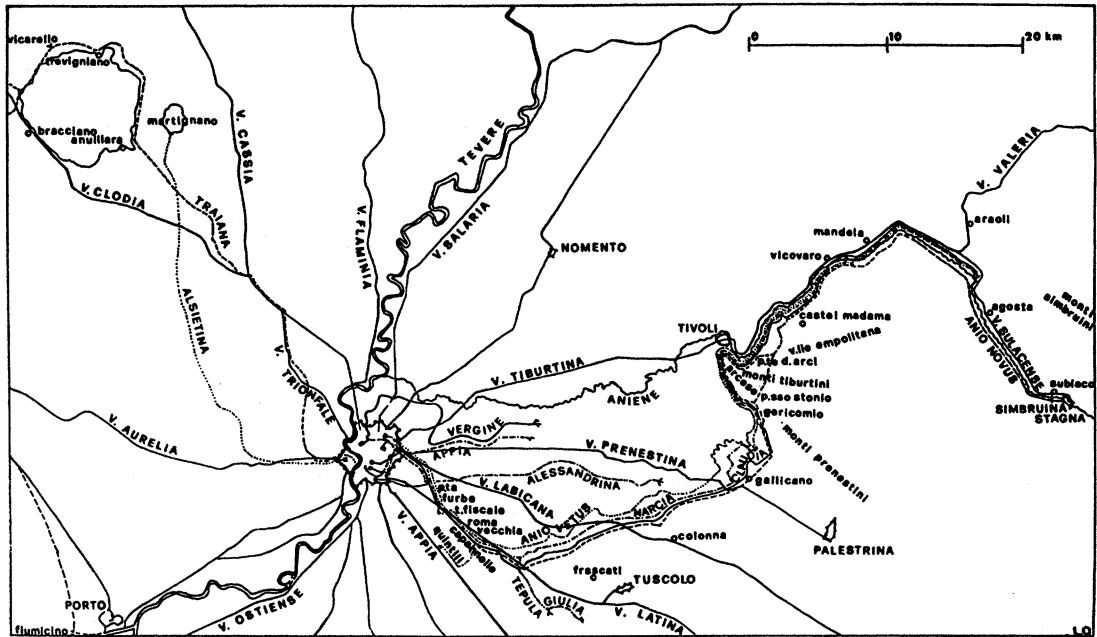
FIG. 2.   MAP OF ROME'S AQUEDUCTS (FROM L. QUILICI, 'L'ANIO VETUS IL SECONDO ACQUEDOTTO DELL'ANTICA ROMA',
ACEACITTÀ 15.3).

evidence for drinking-water in the early medieval city takes the form of wells, which are
referred to in numerous property documents, and are also known from archaeology.[16]

The post-war repair and maintenance of the water-supply was presumably carried
out by the Byzantine administration, to judge from the Pragmatic Sanction, which
makes specific provision for the care of the city's aqueducts in its chapter on public
works (see above, n. 3). Pope Gregory I's letter of 602 was addressed to the Praetorian
Prefect in Ravenna, and in it he recommended a civil patrician for appointment to the
Cura Formarum. It is not until the late eighth century that the *Liber Pontificalis* describes
the Papacy taking charge of the monuments' upkeep. Earlier, however, individual
branch-lines off the main aqueducts were worked on by the Church: in the early seventh
century Pope Honorius I built a mill on the Janiculum, supplied by the Aqua Traiana,
and a century later Gregory II restored the water-supply to the baths at San Lorenzo
fuori le Mura (*LibPont* 62.5, 91.2).

When, in the 770s, Pope Hadrian I carried out major repairs to the four aqueducts
still considered essential to the city's water-supply, we are told that they had been either
out of action, or else functioning fitfully, for twenty years: this implies that the damage
was caused during the three-month Lombard siege of 756. As with his work on the
walls, the pope requisitioned labour from the entire church patrimony, working both
inside the city and in the countryside, and rebuilt the Aqua Claudia, the Virgo, the
Traiana, and the 'Jovia' (the precise identification of this latter will be considered
shortly; Fig. 2; *LibPont* 97.59, 61–2, 65). During the ninth century, we hear of continued
repairs on the Jovia and the Traiana, which supplied the mills on the Janiculum as well
as various establishments at the Vatican, and maybe churches in Trastevere (*LibPont*
103.19, 104.21, 107.16 and 66). Property documents from as late as the eleventh century
describe functioning aqueducts both inside the city, and along the courses of the
Claudia-Anio Novus and Alexandrina aqueducts towards Tivoli and Subiaco. It seems
that the aqueducts ceased to supply the city only during the later Middle Ages: during

---

[16] Rome's water supply in post-classical times is
discussed by Ward-Perkins, op. cit. (n. 1), 135–49.
Church amenities will be considered in more detail in
Section IV, below. For *munera* and *lacus* see Evans,

op. cit. (n. 1), 11. For wells see E. Hubert, *Espace
urbain et habitat à Rome du Xe siècle à la fin du XIIIe
siècle* (1990), 78–9 and n. 55.

the eleventh and twelfth centuries, as references to functioning Roman aqueducts slowly disappear, we hear more frequently of water mills in the city being supplied by the Tiber, and it is during this period that the habitation of the low-lying Tiber bend quarter, later known as the *abitato*, becomes dense. It is only following the popes' return from Avignon that the Virgo was repaired, and new aqueducts were constructed only from the time of Sixtus V, in the late sixteenth century.[17]

We will now consider the physical remains. Despite the silence of Procopius—and all other texts—most archaeologists accept that Belisarius restored the aqueducts after Vitigis' siege. This is based on the presence of surviving sections of masonry in all of the aqueducts composed of alternating courses of brick and small blocks of tufa, and a fragmentary but unreliable inscription from the Aqua Traiana.[18] The restorations were taken by Ashby and Van Deman to represent the work of Belisarius, regardless of whether they appeared in the fabric of the Traiana or any other aqueduct.[19] Such masonry is, however, notoriously difficult to date precisely, since it was used in Rome and the surrounding countryside continuously from the second century A.D. until at least medieval times; a recent excavation of such work on the Aqua Claudia near Porta Furba has, in fact, produced stratigraphic evidence for a date in the early fourth century.[20] Other, rougher examples may well be later, but if so—and at present there is no safe way of dating on the sole basis of masonry—it would be more plausible to attribute them to the Byzantine restoration after the wars, for which we have seen there is good textual evidence, rather than to Belisarius, for which there is almost none.

We can be more confident in dating surviving remains from the late eighth and early ninth century—the restorations of Hadrian I and later popes—due to the narrower dating of the period's characteristic masonry. My survey has concentrated on the Claudia-Anio Novus and the Jovia, since the other two early medieval aqueducts—the Traiana and the Virgo—survive only as subterranean channels.[21] As with his restoration of the walls, Hadrian's work on the Claudia involved the levying of unskilled labour from, in this case, the 'partibus Campaniae', which signifies that much work was to be carried out in the suburbs and countryside of Latium. The aqueduct, with its twin specus, dwarfed all others in terms of its water capacity, according to Frontinus 72. By the eighth century it was used notably for the Lateran Baptistery, baths, and fountain; later property documents suggest that it also supplied private water-mills and even houses at Porta Maggiore, on the Esquiline from Santa Maria Maggiore to Santa Susanna, and along the course of the 'Arcus Neroniani' towards the Palatine (see n. 17).

Starting the summary from Capannelle, where, four miles from the city, the aqueduct emerges from its subterranean channel, we at first see nothing but the original, first-century work in *opus quadratum*. The only traces of eighth-century work are not

[17] Most of the references from property documents are given in Hubert, op. cit. (n. 16), 76–8. *RegSub* 21 speaks of baptisteries near Subiaco being supplied with water from a 'forma antiqua' in A.D. 1051. For the aqueducts of the Renaissance see the exhibition catalogue *Il trionfo dell' acqua* (1986), 203–31.
[18] The inscription was first recorded by A. Cassio, in *Corso delle acque antiche portate da lontane contrade fuori e dentro Roma sopra xiv acquedotti nelle xiv regioni dentro Roma* (1756–7), vol. 1, 260. He reports that the fragment was found by his colleague, Giuseppe Rosatio, inserted in an *opus reticulatum* arch of the aqueduct, later re-used for the seventeenth-century Acqua Paola. The text read 'BELISARIUS ADQUISIVIT. . . / ANNO D. . .' Lanciani says that the inscription was 'malissimo copiato' (op. cit. (n. 1), 166), and indeed it is hard to credit the form 'Anno D' in an ancient inscription. The name Belisarius appears in ancient Latin inscriptions only as a dating reference in epitaphs, and the forms are 'Bil-/Vil-/Vel- or Wil-isarius', never 'Belisarius' (cf. *ICUR*, n.s.) . It is not unlikely, in fact, that Rosatio had copied a modern inscription: Pope Paul V, who rebuilt the Traiana entirely between 1608 and 1612, set up many inscrip-

tions, one of which—the surviving inscription of the terminal fountain on the Janiculum—reads, in its last lines: 'AB MILLIARIO DUXIT / ANNO DOMINI etc. etc.' If a similar phrase had appeared in a contemporary inscription relating to work at the springs, it might easily have been mistaken for Cassio's text.
[19] Van Deman, op. cit. (n. 1), 20, 330, 334; Ashby, op. cit. (n. 1), 99, 240, 310.
[20] D. Mancioli, A. Ceccherelli and R. Santangeli Valenzani, 'Indagini all' acquedotto Claudio-Felice nell' area della Banca d' Italia', *Archeologia Laziale* 12.1 (1995), 307. This masonry, known as 'opus vittatum' or 'opus listatum', appears in phases of the Castro Pretorio and Aurelianic Walls dating from the third to the nineteenth century.
[21] Quilici's study of the underground specus of the Virgo failed to reveal any trace of post-classical work ('Sull' acquedotto Vergine dal Monte Pincio alle sorgenti', *Quaderni dell' Istituto di Topografia Antica della Università di Roma* 5 (1968), 125–60). The Aqua Traiana was completely rebuilt by Paul V between 1608 and 1612.
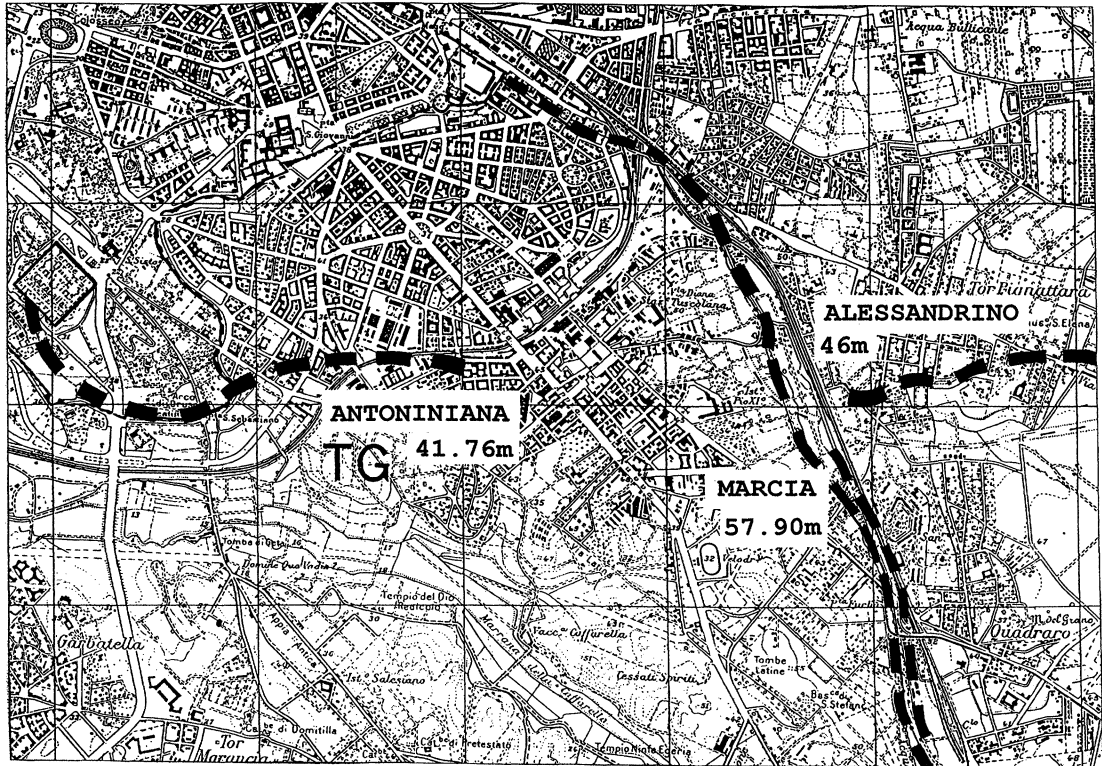
FIG. 3.   COURSE OF SURVIVING AQUA ANTONINIANA (LEFT) AND AQUA ALEXANDRINA (RIGHT).

particularly impressive (Pl. XVII, 1). However, further north towards Porta Furba, the
Roman builders substituted peperino stone with a more friable reddish-brown variety
of tufa which needed constant rebuilding from at least the early second century onwards.
Here, the eighth-century work is far more ambitious, consisting of the construction of
immense buttresses along both sides of the aqueduct, running from the ground up to
include the higher, Anio Novus specus (Pl. XVII. 2): in other words, a genuine
archaeological example of the familiar *Liber Pontificalis* claim 'a fundamentis'.

Very little early medieval work survives inside the city. What there is remains in the
important branch supplying the Lateran. Several rebuilt piers survive within the
grounds of the Villa Wolkonsky, between Porta Maggiore and the Lateran, constructed
in the familiar undulating, re-used brick (Pl. XVIII, 1). Just west of here, similarly-
rebuilt stretches were destroyed in the 1920s during the widening of Via E. Filiberto.[22]

This is all that remains of the early medieval rebuilding carried out on the elevated
stretch between Capannelle and the city-centre. Future investigations beyond Tivoli,
towards Subiaco, where the Claudia and Anio Novus specus separate, might reveal
whether both aqueducts were maintained, and if any work was carried out at the springs.

Finally, we consider the so-called 'Aqua Jovia'. The toponym first appears in the
seventh century, in a pilgrim's itinerary inserted in the Einsiedeln sylloge. The text
runs: 'Inde ad Portam Appiam. Ibi forma Iopia, quae venit de Marsia et currit usque ad
ripam'. [23] This is generally believed to describe a branch of the Aqua Marcia ('venit de
Marsia'), which crossed the Via Appia at Porta Appia, over the so-called Arch of
Drusus, before running to the Tiber ('currit usque ad ripam'). Such a route would
presumably fit that of the aqueduct now known as the Antoniniana of Caracalla (Fig. 3).

[22] Colini, op. cit. (n. 12), 97. His fig. 54 provides a
very clear view of the eighth-century brickwork of a
pier next to the Scala Santa which still survives, but
has since been heavily restored.

[23] Valentini and Zucchetti, op. cit. (n. 4), 2.173.

This, too, runs over the Arch of Drusus to the Baths of Caracalla, and is generally considered to be a branch of the Aqua Marcia, although no traces survive east of Via della Circonvallazione Appia and any junction with the Marcia is therefore entirely conjectural. The water supplied to the Baths of Caracalla did eventually flow, by way of sewers, out of the Baths and into the great Murcia drain in the Circus Maximus, finishing in the Tiber. Further references to the Aqua Jovia appear in the later Einsiedeln itineraries, and the *Liber Pontificalis*, where we learn that it was restored by Hadrian I, Sergius II, and Nicholas I—that is, up to the 860s: no more precise topographical information is given, however.[24]

The purpose of a water-supply in this region of the early medieval city has excited some debate. There is much archaeological evidence that the water was exploited for various uses within the Roman bath-complex itself. A water-mill was discovered in 1912, built into subterranean chambers of the north-west exedra: it has been variously assigned both to the late Roman and the medieval periods. A latrine inserted in the north library has been described as 'later than the fourth century'. And traces of precarious timber habitations, together with a large necropolis dating from the sixth to the eighth centuries, have been excavated within the south-east exedra. Beyond the Baths, the Einsiedeln claim that the water continued 'usque ad ripam' has found archaeological support from the excavation, in the hemicycle of the Circus Maximus, of ground-level water-channels dating from the sixth to the tenth centuries, built to supply water-mills. Along its course from the Baths to the Tiber, the water would also have been able to furnish the *diaconiae* (charitable institutions) of Santi Nereo ed Achilleo, Santa Lucia in Settezonio, and Santa Maria in Cosmedin.[25]

Up to this point it seems that the 'Jovia' of the medieval texts signifies simply the Aqua Antoniniana, perhaps including its outflow to the Tiber. However, three tenth-century documents from the Subiaco register clearly use the term 'Jovia' to describe the aqueduct known today as the Alexandrina, of Alexander Severus (*RegSub* 12, 14 and 105). In these, the 'forma que appellatur Jovia' is located near a farm at the fourth mile of the Via Labicana, and can therefore only represent the Alexandrina.[26]

Further proof that the 'Jovia' of the texts was also used to signify the Alexandrina comes from an examination of the Alexandrina's surviving remains. The long section running on arcades over the many rivers and streams of what was still, until thirty years ago, the Roman *campagna* preserves on its northern, windward side a great amount of clearly eighth- or ninth-century refacing in undulating courses of re-used brick (Pl. XVIII, 2). Some piers have been entirely reconstructed in another familiar eighth-century technique, re-used *opus quadratum*. Considering that no other aqueduct apart from the Claudia-Anio Novus shows such characteristic eighth- or ninth-century work, we must surely be confronted here with the three papal restorations of the 'Aqua Jovia' by Hadrian I, Sergius II, and Nicholas I.

It now becomes apparent that there is a problem in the interpretation of the 'Aqua Jovia' toponym. Textual evidence shows that the term was applied both to the aqueduct known today as the Alexandrina, and also to the Antoniniana. Archaeological evidence also suggests that in its references to repairs on the Jovia, the *Liber Pontificalis* was

[24] Valentini and Zuchetti, op. cit. (n. 4), 2.199; *Lib-Pont* 97.61, 104.21; 107.16.

[25] The mill was discovered in 1912, and assumed to be connected with medieval milling and dyeing (G. Gatti, 'Notizie di recenti trovamenti di antichità in Roma e nel suburbio', *BCAR* 40 (1912), 159); when re-excavated in 1980, no material later than the early fifth century was found, however (T. Schiøler and Ö. Wikander, 'A Roman water-mill in the Baths of Caracalla', *Opuscula Romana* 14 (1983), 55–64). For the latrine and 'medieval settlement' see I. Iacopi, 'Terme di Caracalla. Note sul progetto di indagine archeologica', in *Roma: archeologia nel centro I. L'area archeologica centrale* (1985), 584–96. A renaissance well-head in the north palaestra points to exploitation of the subterranean drains to a very late date, and the

engineer L. Lombardi tells me that he has found terracotta water-pipes roughly inserted into calcareous deposits in the outflow of the main cisterns of the Baths—evidence for a supply of water into the complex after a long period of disuse. The excavations in the Circus Maximus are described by P. Brandizzi Vittucci, 'L' emiclico del Circo Massimo nell' utilizzazione post-classica', *MEFRM* 103 (1991), 23–6.

[26] Lanciani, who believed that the 'Jovia' was in fact the Aqua Marcia, cited one of these documents erroneously, in such a way that the farm appeared to be situated near Tivoli, thus providing apparent proof that the aqueduct was indeed the Marcia (op. cit. (n. 1), 107); the error was then repeated in Ashby, op. cit. (n. 1), 91.

referring to the Alexandrina. A possible solution to this puzzle, which remains only a hypothesis at present, would call into question the current identification of these two Roman aqueducts. This is that both the Alexandrina and the Antoniniana are in fact a single aqueduct (Fig. 3). It is noted that no remains of the Antoniniana have been found east of Via della Circonvallazione Appia. It is equally significant that no remains of the Alexandrina have been identified west or north of Via degli Angeli. The common opinion that the Aqua Antoniniana was simply a branchline of the Aqua Marcia has never been proved with any physical evidence—or any textual evidence beyond 'venit de Marsia', which in fact appears to be a reference to the generic place-name associated with all of the eastern aqueducts' springs, in the Marsicana territory of the Abruzzi. If the Antoniniana did branch off the Marcia, it is difficult to explain the disparity in levels: at the most likely junction-point the Marcia specus lies at a level 59 m above sea-level. The Antoniniana specus at Via della Circonvallazione Appia is far less, approximately 42 m. Such a sudden drop would call for a complex system of descending channels, none of which have been found. If, on the other hand, the Alexandrina were to continue westwards, and cross the Marcia and the Claudia before joining up with the Antoniniana, a regular and gentle gradient would be produced: the level of the last known point of the Alexandrina is 46 m.[27]

Such a solution must obviously remain only a hypothesis at present. In proposing that the two structures now known as the Aqua Alexandrina and the Aqua Antoniniana were in fact a single aqueduct, the ancient 'Aqua Antoniniana' of the Regionary Catalogues, it would also be necessary to identify the 'Aqua Alexandrina' referred to by the same catalogues, as well as by the Scriptores Historiae Augustae. This aqueduct is never located topographically by any ancient text, and was only identified with the remains of the aqueduct we see today by Fabretti, in 1680.[28] Since we know that Alexander also built the monumental nymphaeum known as the 'Trophies of Marius', furnished with water by an imposing off-shoot of the Aqua Claudia-Anio Novus, it would seem logical to identify the Aqua Alexandrina with this same aqueduct branch, whose arcades survive today near Stazione Termini in Piazza G. Pepe.[29]

The identification of the 'Jovia' suggested here, then, whilst simply a supposition at present, at least satisfies a double problem: firstly, the lack of physical remains of either the Antoniniana or the Alexandrina east or west of their respective vanishing points, and, secondly, the fact that our early medieval texts at present appear to refer to two aqueducts with only one name. No other theory has yet been advanced which confronts these difficulties.

[27] Levels from Lanciani (op. cit. (n. 1), 170) and G. Garbrecht and H. Manderscheid, 'Etiam fonte novo Antoniniano. L' acquedotto Antoniniana alle Terme di Caracalla', *Archeologia Classica* 44 (1992), 206–8. In the seventeenth century Fabretti reported seeing remains of what he believed to be the Alexandrina further north of Via degli Angeli (*De aquis et aquaeductibus veteris Romae* (1680), 4). They had vanished by Lanciani's day, but, even so, we can be sure that they did not belong to the aqueduct, since the ground-level of the (surviving) vineyard and villa visited by Fabretti (the Villa Certosa, in the modern Via Casilina, number 222) is considerably higher than that of the specus in Via degli Angeli. On the other hand, a plan drawn by Gismondi in the 1920s shows the Alexandrina continuing, underground, due west of Via degli Angeli, towards the Marcia-Claudia, and hence the Antoniniana (T. Ashby and G. Lugli, 'La villa dei Flavi cristiani "ad duos lauros" e il suburbano imper-

iale ad oriente di Roma', *MemPontAc* 3.2 (1928), pl. xx).

[28] Fabretti, op. cit. (n. 27).

[29] The toponym 'Aqua Antoniniana' appears only in the various late antique regionary catalogues of Rome (Valentini and Zucchetti, op. cit. (n. 4), 1.154, 185, 255, 309), but the common opinion that it was built by Caracalla specifically to furnish his new baths seems logical. The 'fonte novo antoniniano' of the same emperor's inscription at Porta Tiburtina can refer only to the adaption of a new spring for the Marcia, not to a branch off it (*CIL* VI.1245). The 'Aqua Alexandrina' is first mentioned in SHA, *Alexander* 25.3. Contrary to common opinion, however, the passage does not state that it was built to supply the reconstructed Baths of Nero, which had in any case always been furnished by the Virgo. For the 'Trophies of Marius' and its supply see M. Steinby, *LTUR* 3.351–2.

IV. CONCLUSIONS

Archaeological evidence for the early medieval rebuilding of the Aurelianic Walls and three of the great aqueducts has now been produced for the first time. It represents not small-scale refacing or cleaning work, but a substantial series of reconstruction campaigns. Whole towers were rebuilt, literally 'a fundamentis'. Entire series of aqueduct arcades were reconstructed, up to a height of 20 m, and for a distance of many kilometres. The majority of these interventions were carried out during the late eighth and early ninth century—but a variety of textual, archaeological, and circumstantial evidence demonstrates that both the walls and the aqueducts were functioning throughout the period under consideration, with only the aqueducts falling into general abandon during the later Middle Ages.

Like many ancient cities during the early medieval period, Rome found that of all her inherited monuments, the city walls were the most important in the new and uncertain political climate. While palaces, temples, and the places of public entertainment were destroyed for their building materials, converted to other uses, or simply left to decay, the monumental defences were continually maintained, rebuilt, garrisoned, and even augmented. Unlike other well-fortified Roman cities, such as Milan, Verona, or Terracina, Rome never reduced the course of her walls: never, during the entire early medieval period, did the population of the enormous city retire into a smaller, more easily-defended part of the original fortifications, nor even was any outlying salient cut off from the rest of the circuit. This implies that the population of early medieval Rome was not only sufficient to carry out the requisite skilled and unskilled labour to maintain the structure, but also to garrison the complete circuit in times of siege. The distribution of settlement across the city, too, must have been large enough to necessitate the continued use of the entire circuit of the fortifications, rather than a reduced enclave.[30]

If we can explain the continued upkeep of the walls by the simple fact that they were an absolute necessity for the preservation of the city and its population in our period, the regular conservation and use of the aqueducts at first seems more unusual. How could the enormous expense and logistical problems of maintaining such immense and far-flung structures be justified by their luxurious function? The *Liber Pontificalis*, when referring to the uses to which the water-supply was put, stresses spiritual and physical necessity as opposed to more sensual benefits. Emphasis is placed on baptisteries, specifically those at the Lateran and Saint Peter's, and the mills of the Janiculum. When baths are mentioned it is clear that they are not intended as a luxury, but are 'for the needs of pilgrims and those who serve there [at Saint Peter's]', 'where our brethren Christ's poor. . .wash' (97.62, 81 and 59). There were also baths at the following churches: San Clemente, San Martino ai Monti, San Pancrazio, San Lorenzo fuori le Mura, and San Paolo fuori le Mura, and at the Lateran Palace. The presence of baths at the city's eighteen *diaconiae*, or charitable institutions, has also been proposed. In short, whether viewed as a necessary element of Christian charity or as a simple

[30] Reduced post-Roman defensive circuits: M. Cagiano de Azevedo, 'Il restauro di Narsete alle Mura di Milano', *Istituto Lombardo. Accademia di Scienze e Lettere. Rendiconti* 112 (1978), 259–79; G. Cavaliere Manasse, 'Le Mura Teodericiane di Verona', *Atti del 13 congresso internazionale di studi longobardi. Teoderico il Grande e i Goti d' Italia* (1993), 635–44; N. Christie and A. Rushworth, 'Urban fortification and defensive strategy in fifth- and sixth-century Italy: the case of Terracina', *JRA* 1 (1988), 73–89. I know of no attempt to calculate the numbers necessary for garrisoning Rome's walls; according to Procopius, Belisarius complained to Justinian that he had 'only' 5,000 soldiers for such duties (*BG* 1.24.2), which puts into perspective a recent estimate of 5,000 for the total early medieval population of the city! (R. Hodges,

'The riddle of St Peter's Republic', in L. Paroli and P. Delogu (eds), *La storia economica di Roma nell' alto medioevo alla luce dei recenti scavi archeologici* (1993), 356). The most reliable estimates of Rome's population up to the sixth century have been calculated by J. Durliat on the basis of the *annona* (*De la ville antique à la ville byzantine* (1990), 113–23): his figure of 60,000 for the end of the Ostrogothic period would presumably have fallen considerably after the Gothic Wars, only to increase marginally as a result of the influx of refugees following the Lombard invasions. Krautheimer, op. cit. (n. 1), 65, in fact allows a maximum of 90,000 at the time of Gregory the Great. For a discussion of settlement in the city from A.D. 500 to 1000 see R. Coates-Stephens, 'Housing in early medieval Rome', *PBSR* 64 (1996), 239–59.

luxury, small bath-houses were clearly a common feature in early medieval Rome. Together with baptisteries, the Janiculum mills, and perhaps even public fountains, they formed a vast potential destination for artificially-supplied water, and thus good reason for the papal reconstructions and maintenance of the city's four great aqueducts.[31]

Of course, all of these represent only those amenities known to have been maintained by the Church. Surviving property-documents testify to the presence of (probably) private water-mills at Porta Maggiore and near San Cosimato in Trastevere, which could only have been supplied by aqueducts, presumably the Claudia and Traiana respectively (see above, n. 17). We have also seen archaeological evidence for similar fixtures at the Baths of Caracalla and in the Circus Maximus, both probably supplied by the 'Aqua Jovia'. The same property documents often mention private houses' supplies of 'aqua viva', which raises the possibility that private exploitation of the artificial water-supply, whether for drinking, washing or even for small baths, was also widespread.

An additional element of continuity between classical and early medieval Rome is represented by the technology involved in the rebuilding of the walls and aqueducts. The considerable survivals of such work, summarized here, were solid enough to withstand over a thousand years of continual siege, flood, and earthquake. Their construction techniques, whilst lacking the refinement of the Roman period, show strong similarities with ancient work: a rubble core, faced with coursed brick or squared stone, the whole mixed with pozzolana mortar. The clumsiness of the finishing observed here should not detract from the plain fact that this type of construction, unlike, for example, the fragments of fresh-cut basalt and small tufa blocks of the later Middle Ages, or the heterogeneous selection of materials favoured in the seventeenth and eighteenth centuries, is entirely Roman in origin. The typology of the eighth- and ninth-century towers of the Aurelianic Walls, too—their form and dimensions, windows, staircases, and, it seems, vaulting—was precisely copied from the late Roman models of the original circuit.

Lastly, the extent of the restorations gives an idea of the efficiency of the papal organization of public building in the early medieval city. The popes were able to convoke and presumably transport large labour-forces from as far away as Tuscany and Campania, and then to support them with rations and even wages for the duration of the works. The expenditure of Hadrian I on the walls alone was 100 lbs of gold—that is, as much as one half of the total Ostrogothic expenditure on all public building given by the Anonymous Valesianus (n. 2, above), at a time when not only the walls and aqueducts, but also the imperial baths, circuses, theatres, and even the Colosseum were in use. Whilst such organization had been in place with regard to church-building since Constantine's day (or even before), it is precisely through its application to the reconstruction of the walls of Rome that the papacy chose to reveal itself in clear competition with the imperial authority of Byzantium. Rome was now preserved not by the emperor, but by her bishop, who rebuilt the city walls and restored her water-supply.

The British School at Rome

---

[31] For church baths see *LibPont* 48.12, 53.8, 97.62; for the bath at San Martino ai Monti, known from an inscription, see A. Silvagni, 'La basilica di S. Martino', *ASRSP* 35 (1912), 408–10. The bath at San Clemente is currently being excavated (by F. Guidobaldi) and awaits publication. For baths and *diaconiae* see R. Davis, *The Lives of the Eighth-Century Popes* (1992), 238. Baptisteries are recorded by the *Liber Pontificalis* in addition at Sant' Agnese fuori le Mura, San Vitale, Santa Maria Maggiore, Santa Sabina, San Paolo fuori le Mura, San Lorenzo fuori le Mura, San Michele in the Vicus Patricius, Santa Susanna, and Santa Maria in Trastevere (34.23, 42.5, 46.3 and 7, 46.8, 48.2, 48.10, 53.9, 98.9, 106.30), and known from excavation at San Crisogono, San Marcello al Corso, Santo Stefano on the Via Latina (Krautheimer, op.

cit. (n. 10), 1.152, 2.211 and 4.249), Santa Cecilia (*RAC* 67 (1991), 451–3), San Lorenzo in Lucina (*Archeo* 9.1 (Jan. 1994), 27), San Marco (*RAC* 68 (1992), 336–7) and Santa Croce in Gerusalemme (*MEFRA* 108 (1996), 780). Regarding fountains, we have Flodoard's description of the Aqua Virgo after its restoration by Hadrian I: 'Multiplicat renovans diversa lavacra labore / Virgineaque rigat rivis populi agmine formae' (*De Christi triumphis apud Italiam*, PL 135.808; this may represent an early reference to the Fountain of Trevi). Flodoard also speaks of a fountain at the Lateran (op. cit., 806). The *Liber Pontificalis*, 53.7–8, describes fountains at Saint Peter's and Sant' Agata on the Via Portuensis, and a property document of A.D. 955 records another outside the Porta Flaminia (PL 133.916).