BUILDING IN EARLY MEDIEVAL ROME, 500 - 1000 AD

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Abstract

The thesis concerns the organisation and typology of building construction in Rome during the period 500 - 1000 AD. Part 1 - the organisation - contains three chapters on: (1) the finance and administration of building; (2) the materials of construction; and (3) the workforce (including here architects and architectural tracts). Part 2 - the typology - again contains three chapters on: (1) ecclesiastical architecture; (2) fortifications and aqueducts; and (3) domestic architecture.

Using textual sources from the period (papal registers, property deeds, technical tracts and historical works), archaeological data from the Renaissance to the present day, and much new archaeological survey-work carried out in Rome and the surrounding country, I have outlined a new model for the development of architecture in the period. This emphasises the periods directly preceding and succeeding the age of the so-called "Carolingian Renaissance", pointing out new evidence for the architectural activity in these supposed dark ages. At the same time I have discovered and presented physical evidence for the important papal rebuilding of the city's fortifications and water-supply during the eighth and ninth centuries. A thorough re-examination of over one hundred years of archaeological publications has provided data for a new outline of the city's early medieval habitation.

A picture emerges of an increasingly independent, centralised building administration run by the Church of Rome, breaking away very early from the ambit of Byzantium, and almost entirely uninfluenced by developments in Carolingian Europe. The eclipse of papal authority at the end of the ninth century led to an increasingly vital sector of private architectural patronage. At the same time, however, building techniques never departed radically from those of the Early Christian, or indeed Late Roman, periods.
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Proper names and abbreviations in the text:

Regarding church appellations, I have attempted to follow what appears to be the most common practice when writing in English: disappeared buildings in Latin, surviving ones in Italian. S. Peter's, for some reason, always seems to be left in English; so it is here.

The gates of the Aurelianic Walls and the aqueducts I have left in Latin; exceptions are Porta Chiusa, whose name in Roman times is unknown, and Porta Maggiore, known as Maiore for most of the middle ages (representing the ancient Porta Praenestina). When Porta S. Giovanni is used as opposed to Porta Asinaria, it always signifies the modern gate of Gregory XIII.

Abbreviations commonly appearing in the text are as follows (a complete list is found with the bibliography): AM = Archeologia Medievale; BA = Bollettino di Archeologia; BAC = Bollettino di Archeologia Cristiana; BICA = Bullettino dell'Istituto di Corresponsenza Archeologica; Brev. = Breviarium Ecclesiae Ravennatis; Bull. Comm. = Bullettino della Commissione Archeologica di Roma; CBCR = Corpus Basilicarum Christianarum Romae; CC = Codex Carolinus; CIC/C/D/N = Corpus Iuris Civilis/Codex/Digest/Novellae; CIL = Corpus Inscriptionum Latinarum; CTh = Theodosian Code; Dial. = Gregory I, Dialogues; FUR = R. Lanciani, Forma Urbis Romae; ICUR/ns = Inscriptiones Christianae Urbis Romae/nova series; LC = Liber Censuum; LD = Liber Diurnus; LP = Liber Pontificalis; LPR = Agnellus, Liber Pontificalis Ecclesiae Ravennatis; LTUR = Lexicon Topographicum Urbis Romae; MEC = Monumenta Epigraphica Christiana; MEFR/A/M = Melanges de l'Ecole Francaise de Rome/Antiquite/Moyen Age-Temps Modernes; MGH CM = Monumenta Germaniae Historica Chronica Minora; NS = Notizie degli Scavi; PL = Patrologia Latina; PS = Pragmatic Sanction; RAC = Rivista di Archeologia Cristiana; Reg. = Gregory I, Registrum; SSCISAM = Settimane di Studio del Centro Italiano di Studi sull'Alto Medioevo; Var. = Cassiodorus, Variae; VZ = Valentini-Zucchetti, Codice Topografico della Citta di Roma

NB. All references to Procopius cite volume and page numbers of the complete Loeb edition of H. Dewing.
**Introduction**

Despite an awakening of interest in recent years, the fate of post-imperial Rome still tends to inspire the same views in Britain today as it did in tenth-century Constantinople:

"Listen! That stupid dullard of a pope does not know that the sacred Constantine transferred to this city the Imperial sceptre, the Senate, and all the Roman knighthood, leaving in Rome nothing but vile slaves, fishermen, confectioners, poulterers, bastards, plebeians, and underlings" (Liudprand, Leg. Const. 51).

The idea of Rome as a decaying backwater has generally included the city's architecture. By now, however, the work of a number of Italian scholars has extended the corpus of Roman construction techniques well into the middle ages, proving a remarkable continuity in the selection and use of materials. Most importantly, Richard Krautheimer's exhaustive studies of church architecture up to the end of the ninth century have pushed the "period of the decadence" into a slightly narrower chronology. We are presented now with a cyclical picture of architecture in Rome after the fall of the Western Empire, based on the evidence of the city's surviving or excavated churches.

However, if we stray outside the field of purely ecclesiastical architecture, or even outside the field of church-building in certain particularly rich periods, we are left with very little. No study has been attempted of the Aurelianic Walls during the early middle ages, nor of the aqueducts, both of which we know from the texts to have been of paramount importance at the time; nothing is known of domestic architecture beyond the obscure descriptions in some tenth-century property documents; lastly, and perhaps most surprisingly, the period seems to be punctuated by two "dark ages", comprising the years 640-750 and the entire tenth century, from which even the study of churches has been missing. With such incomplete typological study of architecture in the period, it is perhaps not surprising that very little work has been done on the background of the building
industry: the finance for architecture, the procurement of materials and labour, and above all the architects themselves.

In this thesis I intend to present a general study of precisely these aspects of architecture missing from previous works on the subject. Part One will serve as a background against which individual buildings and projects can be considered; it deals with the funding and administration of building, with the materials of construction, and the labour-force. Part Two presents the first-ever studies of church-building in our two dark ages, the physical evidence for the reconstruction of the city walls and aqueducts, and a preliminary discussion of housing during the period.

The overall timespan, 500 - 1000, is great. My intention has been to cover the entire "early medieval period". There are, of course, numerous reckonings for the "beginning" and "end" of the middle ages. Nowadays, it seems that the most common starting-point for the Italian "Alto Medioevo" is the Lombard invasions and the time of Gregory the Great. I propose to commence at an earlier date, for several reasons. Firstly, the Lombards had absolutely no effect upon the development of architecture in Rome itself; I am looking to the installation of the Byzantine administration to provide a legal framework for building policy in the civil sector. Regarding the Church, we shall see many reasons for viewing 500 AD as a significant benchmark in its building regime. At the other end of the chronological bounds, it seems that studies of architecture in the city tend to re-commence (after the mysterious tenth century) at about the time of Guiscard's sack (1085). By extending my field of study to around the turn of the millenium, both of the "dark ages" will be placed in context. In this way, it is hoped, architecture in the city will come to assume a clearer, more rational development, depending more upon the actual facts than the preconceptions of historians.
Chapter 1: Funding and Administration

A tri-partite division into civil, church and private funding is not wholly satisfactory given the complexity of the politics and the time-span involved. For much of the period the papacy, many of whose officials were laymen, assumed most of the functions of civil administration in Rome. Sometimes it is impossible to say whether a donation of building materials or the foundation of a church by a Byzantine emperor or governor was a state or a private act. A wealthy cleric might found a church or monastery from his or her own funds or with church revenue, and from the sources it is not always possible to tell which. Again, the private bequest of a layperson would often be administered by the Church, and if the funds proved insufficient the building would cease to be financed by private means altogether. Finally, many projects were from the outset collaborative ventures, with funding coming from all three sources.

I have termed civil funding here any finance coming from the Ostrogothic or Byzantine treasuries, church funding as originating from papal revenue, and private funding that produced from individuals' own resources. Where funding came from the rulers of foreign states I have considered this as private. The contributions of the Carolingians and Ottonians will be discussed in 1.1, below.
1.1 Civil Funding and Administration of Building

The central policy of the Ostrogothic regime in Italy was its maintenance of the corpus of Roman laws. The two new large-scale edicts - of Theoderic in around 500 and Athalaric in 533-4 - made no changes to the funding or administration of public works. We may therefore assume that, in theory at least, the system reflected in the Theodosian Code continued to function. Here, the Praefectus Urbi was in control of the city of Rome's departments of public works, whose funding was becoming increasingly difficult from the late fourth century onwards (Chastagnol, 1960, 335-71). The money came from various sources of taxation: the vectigalia (duties on merchandise), the fundorum (land tax), the fee-paying munera (duties) of various classes and corporations, and certain emergency measures.¹

There is, however, little evidence that it was specifically these Roman taxes which were collected and disbursed for public works under Theoderic. We know for sure that the Arca Vinaria (see note 1) was maintained: 200lbs (presumably of gold) was allocated annually from this source to pay for the maintenance of the Palatine palace and Rome's "moeniae civitatis"² (Anon. Valesianus 67). Further proof that the annona was also a principal source of funding for construction work comes from Theodahad's order to repair the Via Flaminia: "annonarum designatarum copia sine aliquo possessorum dispendio..."³

¹ There is no consensus on the exact meaning of "vectigalia" as it is used in the Theodosian Code and Justinianic Corpus. Briefly, it signifies various forms of taxation mostly concerning trade and commerce (CICD XXXIX, 4; CTh IV, 13, 6; XI, 12, 3). The proportion of a municipality's vectigalia most often assigned to public works (generally one quarter or one third) seems to be taken from customs dues (CTh IV, 13, 5 & 7; 358 AD & 374 AD), although specific sales taxes are implied in CICC XI, 42, 7 (440 AD, "vectigalia quae colligi possunt ex universis scalis" to go specifically for the repair of Constantinople's aqueducts). Fundorum: one third of each municipality's income from this source to go to public works (CTh V, 14, 35 & XV, 1, 32; both 395 AD); certain estates had their entire revenue obligated to maintain the aqueducts (cespes formensis - Novella of Majorian 5.4; 440 AD). Corporations' munera defined in CICC L, 4; carpenters, builders, transporters and lime-burners paid into the Arca Vinaria to fund the annona & various public building (Chastagnol op. cit. 341); taxes of the "Cyzicensii" for aqueduct repair at Constantinople (CICC XI, 42, 7; 440 AD). Property owners to pay for local road and wall repairs in CTh XV, 3, 5 (412 AD) & XV, 1, 51 (413 AD). Lastly, there are various references to building funds being topped up from "aliis titulis" (Chastagnol op. cit. 339; CICC XI, 42, 8; 474-91 AD, which includes "the liberality of the consuls").

² The expression is discussed by Della Valle (1958) and B. Ward-Perkins (1984, 46 n.39). It can mean either "city walls" or "public buildings"; occasionally the context furnishes more precision.
congregatur" (Var. XII, 18). Elsewhere, we hear rather vaguely that the repair of public buildings is to be financed from "deputatis reditibus", although we never learn precisely which revenues (Var. I, 25). In other cases, the source of Theoderic's funding is termed generically as the cubiculum, or treasury (Var. IV, 51).

It has been suggested that the Ostrogothic cubiculum was not in a flourishing state when siezed by the Byzantines in 540 (Hendy, 1985, 281). Indications as to the particular difficulty of financing public works are given by Theoderic's methods, recorded in the Variae. Here, almost every attempt by the king to restore Rome's monuments involves the collaboration of the private sector. Generally the treasury would allot certain funds to a specific project on condition that contributions were forthcoming from interested parties (I, 21). In some ways this could be seen (and was presumably intended to be seen) as a deliberate attempt to revive the old Roman concept of civic munificence, whose decline has been charted by B. Ward-Perkins (1984). This would hold good in cases where no tangible benefits accrued to the benefactor: the property-developer Symmachus, on being requested to undertake the restoration of the Theatre of Pompey with financial help from the government, is told "you will gain reputation from so excellent a work, while, in my reign, antiquity is fittingly renewed" (IV, 51). The last substantial repairs to the Colosseum were carried out by the Praefectus Urbi, D. Marius Venantius Basilius, at his own expense; his gain in reputation has endured in the form of three inscriptions (CIL VI 32094). Elsewhere, entrepreneurs were requested to undertake various projects of general public benefit while being granted tax concessions and even property rights over the restored monuments (III, 29 & IV, 30, where abandoned public buildings are saved from impending ruin).

There are cases where solely state funds were used, however. The records of another Praefectus Urbi's public works - Valerius Florianus' restorations of the Curia and Atrium Libertatis - make no reference to "sumptu proprio" (Var. IX, 7; Bartoli, 1949-50); we may therefore assume they were publicly-financed. The repair of the Portus Licini brick depot, too, was funded by the state (Var. I, 25). Furthermore, Theoderic's mainte-
nance and slight modification of the system of functionaries working under the Praefectus Urbi shows that certain services remained wholly in the public sphere: the aqueduct office (headed by the Comitiva Formarum Urbis, Var. VII, 6), the lime supply (organised by the Praepositus Calcis, VII, 17), the protection of public monuments against illegal spoliation (by the Comitiva Romana and Architectus Publicorum, VII, 13 & 15), and the care of the palaces (under the direction of the Cura Palatii, VII, 5). Each department maintained its own workforce, although, as we shall see in 3.2, not without some difficulty.

The rich ancient and modern documentation of Ostrogothic public works in Rome means that this comparatively brief period is in danger of overbalancing the brief survey of the early middle ages attempted here. In fact, more recent works have tended to play down Cassiodorus' picture of a vigorous building regime during these years (F. & A. Guidobaldi, 1983, 502; B. Ward-Perkins, 1984, 46-7). We will consider the physical evidence for Theoderic's intervention on the city walls and aqueducts, as well as his revival of tile-production, in chapters 2 and 5. Here it is worth mentioning the contemporary views of disinterested observers. We might expect fulsome praise for the Ostrogothic building programme from such as Cassiodorus, Ennodius and even Isidore, in his History of the Goths (Della Valle, 1959, 129-30). However, we hear similar views from the Byzantines. Zachary of Mytilene terms Theoderic an anti-Caesar and says that he "conferred many benefits on his city, Rome, erecting buildings and granting privileges" (Chron. VII, 12). Procopius' statement that the Romans seemed unique in their great respect and care for their city was based upon observations made during his stay in Rome as secretary to Belisarius, that is, at a time when the Ostrogoths' measures would have been most apparent (V, 281). Finally, in a far wider sense, the Pragmatic Sanction itself states in its opening chapter that all measures taken by the Ostrogothic authorities up to the time of Amalasuntha are to be accepted by the new administration (CICN app. II, 7).

3 Barnish suggests that the Variae themselves may have influenced Byzantine building administration, since a North African inscription repeats part of a Variae formula for the appointment of the Praefectus Vigilum; it is, of course, equally likely that both texts are themselves drawn from a more ancient original (Var. ed. xv).
The military works carried out in Rome during the Gothic Wars must have been financed from the respective Ostrogothic and Byzantine treasuries, although there is little specific evidence for this (in fact Procopius suggests that Belisarius paid the artisans working to re-fortify Carthage with his own money - II, 195; we have mentioned the Ostrogothic use of the annona to fund the repair of the Via Flaminia in 535). Belisarius' xenodochium in Rome and monastery at Orte seem to have been funded directly from the Vandal spoils (LP LXI, 2).

With the re-incorporation of Italy into the Roman Empire in 554 we can again turn to official documents relating to civil funding for public works. However, the framework laid down in these Byzantine texts - the Pragmatic Sanction, the Novellae of Justinian and the Summa Perusina - is seldom confirmed by more descriptive sources. Chapter 25 of the Pragmatic Sanction is headed "ut Fabricae Publicae Serventur" and concerns Rome specifically. Here the public buildings, including the Forum, the port, the aqueducts and the Tiber banks, are to be maintained from the customary taxes ("ex isdem tantummodo titulis, ex quibus delegata fuerunt"). To judge from Justinian's other new laws, however, the customary taxes for public works had already undergone a considerable shake-up: they were now collected by a city's "patrem civitatis", who was himself elected by a group of principal citizens under the notable influence of the bishop (CICN CXXVIII, 16b; 545 AD; this officially-recognised importance of the Church in administering the funding of public works is the most significant development here, and will be discussed in detail below, 1.2). There is no doubt that taxes were collected in Italy by the Byzantines (Brown, 1984, 112ff); and the Novellae at least laid the legal framework for their disbursement to public works (XVII, 4 of 535 AD includes aqueducts, harbours, roads, walls, and public places; CIL, 2 of 569 adds public baths and theatres and thus seems more relevant to the east). Two Novellae confirm the powers of Rome's Praefectus Urbi (at least in his judicial role), although they pre-date the reconquest (LXX, 1 & LXXIX, 2 of 538 & 539).

The Summa Perusina, an enigmatic epitome of the first eight books of the Justinia-
The Code, is variously dated from the early seventh to the eighth centuries; some commentators believe that it was written in Rome (Leicht, 1936, 216). By its very nature as a compendium, it includes a shortened version of Justinian's book VIII, 10-11 on private and public building, including CICC VIII, 11, 11 that the funding of public works is to come from "tertia parte redibus publicis" (SP VIII, 11, 10; see n.1, above, where the Theodosian original, XV, 1, 32, gives the source of revenue as the "fundorum"). The problem with this text, and other similar epitomes⁴, is that there is no evidence that they reflect actual administrative practice in Byzantine Rome, or even that they were written with any practical intention; the inclusion of "therma" in the cited public buildings clause would suggest that the text had no relevance to contemporary buildings in Italy.

When we turn to more descriptive records of Byzantine Rome we find a very different picture of the civil administration of public building. All specific references to works carried out by the Byzantine government show that these were the charge not of Rome's Praefectus Urbi, but of the governor of Italy, who occasionally delegated such matters to the Praefectus Praetorio⁵. There is various, if fragmentary, evidence that Narses inaugurated public works in the city. The best-attested is his repair of the Ponte Salaria, one of many bridges over the Anio destroyed by Totila (CIL VI, 1199; there is no mention of funding here, but in the absence of references to "sumptu proprio" we should imagine it was from a public source). Benedict of Soracte, writing four hundred years later, records this work, adding that Narses built a church and monastery at Aquas Salvias and enriched all the churches of Rome (Chron. 8b; little is known of the early medieval architectural phases at Aquas Salvias, but sixth-century sculpture fragments have been found there - Broccoli, 1980). Other sources give vaguer testimony: that he was "zealous in restoring churches" (Paul the Deacon II, 3), that he spent twelve years restoring the towns and "moenia" of Italy (Auctarii Hanniensis Extr. 1.4), and that in Rome he set up his

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⁴ Discussed by Leicht (1947), who never considers that any could simply have been copied indiscriminately in monastery scrinia.

⁵ B. Ward-Perkins, 1984, 48; Brown, 1984, 10-12. See especially the role of the papacy, 1.2 below. It seems that the Praefectus Urbi ceased to exist shortly after 599 AD. When the post re-appears consistently during the tenth century it has a purely judicial function (cf. Halphen, 1907, 147; Arnaldi, 1982, 10).
statue on the Palatine and Capitol (Chron. Horosii) and resided in the imperial palace (LPR 95). From these, many claims have been made regarding specific building works by the general, none of them more than suppositions.

Other evidence attributes various minor works to the exarchs. Cecchelli has assigned the monastery of SS. Sergius & Bacchus in Callinicum to the exarch Callinicus (596-c.600) on the basis of its appellation (1958, 267); further proof could be the presence of the two soldier-saints flanking Gregory I in a fresco at S. Maria Antiqua, which suggests that their cult was indeed introduced to Rome at this time (Rushforth, 1902, 31). The dedicatory inscription of the Column of Phocas records only the role of the exarch, in this case Smaragdus, in the project (CIL VI, 1200; the only new building work here involved the construction of the podium's marble steps - LTUR 307). The Liber Pontificalis attests what was probably the last building contribution of Byzantium: the exarch Eutychius' donation of six spiral onyx columns to the shrine of S. Peter during the pontificate of Gregory III (XCII, 5; see 2.3.2, n. 8 for a discussion of these).

Regarding the maintenance of Rome's essential public structures, it seems that the Byzantine administration did in fact carry out a bare minimum of work. The damage caused during the Gothic Wars to both the city walls and aqueducts was repaired to the extent that the former withstood the Lombard sieges of 579, 592 and 593, whilst the latter functioned fitfully but continuously until Aistulf's siege of 756. There is no evidence that these repairs were carried out by the Church, although the papacy did urge the civil powers to be more efficient: Gregory I's often-cited letter to the Praefectus Praetorio in

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6 These include the restoration of other Anio bridges (Mari in Ashby, 1986, 32 & 40) and the construction of many contemporary Roman churches which display "Byzantine" features: S. Giovanni a Porta Latina (Schumacher, 1973, 124), SS. Apostoli (Testini, 1980, 681) and S. Maria Antiqua (Tea, 1930, 41). For contemporary work on the city walls (proposed by Bertolini, 1941, 206 and F. & A. Guidobaldi, 1983, 510 who include the Palatine palace) see chapter 5 below.

7 M. Cecchelli Trinci, apparently unaware of her father's suggestion, proposes a connection with Callinicus the patriarch of Constantinople, reputed to have been exiled to Rome in 705 (1992). The link between a general and these saints would appear more apposite.

8 See chapter 5 for a discussion of textual and archaeological sources concerning the chronology of destructions and restorations of the walls and aqueducts.
Ravenna shows us that in 602 the aqueducts were working again after being cut by Vitigis, although they were in urgent need of new repairs (Reg. XII, 6). Gregory recommends the appointment of a civil patrician to Cura Formarum; the pope's role here as a petitioner for civil functionaries follows the Justinianic Novella CIL of 569 AD. The fact that the Liber Pontificalis makes no claims for papal interventions on the main aqueduct channels until the late eighth century, and at the same time attributes the twenty-year failure of the water-supply to "great neglect and unconcern" can be taken as proof of continuing civil care for this service (LP XCVII, 59, 61, 97).

The maintenance of the imperial palace is attested by the solitary inscription of Plato, father of the future pope John VII, who held the office of Cura Palatii Urbis Romae before his death in 687 (LP ed. Duchesne I, 386, n.1). The post is almost certainly a Byzantine version of Theoderic's palace architect, although by now it concerns specifically Rome. The inscription records the repair of the ramp leading from the Forum to the Palace of Tiberius. Given that the Palatine palace was the official residence of the emperor and exarch whilst they were in Rome and of their permanent administration in the city it seems certain that the Greek Plato was an architect serving within the administration; it is not impossible that his specific recorded achievement was carried out as a preparation for the visit of Constans II in 663 (LP LXXVIII, 2-4).

We have seen then that between 554 and c.751 the Byzantine civil administration carried out various public works in Rome: the most prestigious - the repair of the Ponte Salaria, the column to Phocas and the donation to S. Peter's shrine - were carried out by the exarch himself; others - the maintenance of the aqueducts and imperial palace - by the Curae Formarum and Palatii respectively, probably under the charge of the Praefectus Praetorio. The city walls were repaired between 554 and 579. If we accept the legal texts,

9 Another of Gregory's letters shows that control of the aqueducts and city gates of Naples also remained in the hands of civil functionaries (Reg. IX, 76).

10 For the Byzantine use of the Palatine palace see Bartoli, 1947-9 & B. Ward-Perkins, 1984, 167 for the suggestion that Constans stayed there. Any connection between Plato's work and the episcopium of John VII (LP LXXXVIII, 2) can be ruled out: John did not become pope until well after Plato's death, and his episcopium should probably be situated within the so-called Temple of Apollo (Hurst, 1986, 477-8).
the funding for all of these came from a third part of the country’s taxation. At the same time, various devotional foundations were made by the governors: Narses’ Aquas Salvias and church-donations, and perhaps Callinicus’ SS. Sergius & Bacchus. All such contributions came to an end before the fall of Ravenna, and coincide with the growing interventions of the papacy in this sphere (see below). Bearing in mind this chronology it is interesting to note the legendary timespan of the Byzantine control of Rome reflected in Magister Gregorius’ description of their seat on the Palatine as the “Palace of the Sixty Emperors” - that is, reckoning precisely up to the time of Theodosius III, in 718 (Rushforth, 1919, 36).

Any survey of the civil funding of building in early medieval Rome must decide how to treat contributions from the Carolingian and Ottonian rulers. For such contributions to be considered as civil funding in the same way as the finance of the Ostrogoths and Byzantines it must be shown that certain factors apply. Most obviously, we must be sure that Rome itself is included, in theory and in practice, under these emperors’ rule; then we could proceed to consider the system. Firstly, it should include a legal framework which states that taxes are to be collected and public works financed from them; secondly, an administration concerned with the organisation of such works; and, thirdly, evidence for the works themselves.

Since this is not a historical study and I am not a historian - and, above all, due to necessities of space - I shall not become involved at great length in these questions. Briefly, it seems to me that there is sufficient doubt over the first pre-requisite listed above - whether Rome be considered under the effective rule of these regimes - to consider any building activity initiated by these rulers with that of other foreign states, in 1.3 below. Regarding the administrative system, there is much evidence for the Carolingian and Ottonian provision for public works - but virtually nothing regarding any such works carried through in Rome\textsuperscript{11}. The one exception is the Leonine Walls, built between 848

\begin{footnote}
\textsuperscript{11} The case against effective foreign rule is argued most forcefully by Noble (1984, 277-325) who stresses that the Carolingians never minted coinage in Rome, nor recruited soldiers, nor collected taxes; he admits more influence under the Ottonians (op. cit. 334), although Leicht notes the continuing pre-eminence of
\end{footnote}
and 852. The role of the emperor Lothar here is even admitted by the Liber Pontificalis: "Hoc denique piissimus ac serenissimus Caesar...cum suis fratibus non modicas argenti libras direxit" (CV, 69). The original Frankish capitulary which records the donation is a little more forthcoming, attesting Lothar's raising of a unique empire-wide tax for the project; its date shows that the original promulgation actually preceded Leo IV's reign by some four months (LP ed. Duchesne II, 137 n.46; Gibson & Ward-Perkins, 1979, 31-3). Despite these discrepancies we should stress that the Liber Pontificalis at least records this (apparently solitary) example of state finance. Surviving inscriptions also honour Lothar, but always in second place after Leo (ICUR II, 324, 325 & 347).

The fact that the emperor's role in the Leonine circuit was not ignored by the Liber Pontificalis indicates that the textual silence on any other public work carried out by the French or German administration is not due to a bias in our solely-ecclesiastical texts. It simply seems that the upkeep of Rome's civil buildings ceased after the last-attested papal work in our period (Nicholas I's repair of the Aqua Jovia - LP CVII, 16). By the twelfth century such projects were taken up by the newly-established senate (Hubert, 1990, 66-7). Whether any intermediate works were carried out by Alberic's aristocratic regime (see 1.3 below) is unknown; the inscription recording a restoration of the Pons Cestius by the senator Benedict from his own funds is assigned by Silvagni to the eleventh century (MEC XL, 1).

One final aspect of building administration at the end of our period which was possibly in the hands of the northern emperors is the granting of legal rights over public monuments. We have alluded to this as a prerogative of the Ostrogothic kings; after the reconquest it reverted to Byzantium, gradually passing into the hands of the papacy (individual cases will be considered in 1.2 and 1.3). The situation in the tenth century is

Roman laws throughout the period (1947, 566-8). Carolingian capitularies regarding compulsory building services cited by B. Ward-Perkins do not apply to Rome, although there is some evidence that an abuse of the corvée system under Sergius II involved Lothar (1984, 63 n. 32; see 3.3 below). There is no evidence that similar requirements of the Ottonians given by Gregorovius were ever employed in Rome (1894 III, 454ff.). The solitary donations of Charlemagne and Otto III will be considered in 1.3; none would have required any imperial administrative services in Rome.
unclear. We know of many ancient structures in private hands by this time - the Baths of Nero-Severus, the Theatre of Pompey, the Temple of Serapis, the Colosseum - as well as others, newly-converted into churches: the Temple of Fortuna Virilis, the Temple of Mars Ultor, the building now known as S. Urbano, the Temple of Elagabalus and the Temple of Antoninus & Faustina (these will be discussed below in 1.3, and in chapters 4 & 6). Customs dues collected at the city gates, ports and the Milvian bridge were also granted to various monasteries (Hubert, 1990, 102-3). The authority for all of these take-overs is generally unrecorded, although Hubert believes that Otto III was ultimately responsible for the concession of the Porta Ostiensis to S. Alessio in 996 (op. cit. 103, n. 20). It was also Otto who confirmed the sale of a castle near Praeneste to the monastery of S. Andrea in 992 (Mittarelli & Costadoni, 1755-9 IV, app. 2, 605). However, we still hear of papal authority being given for similar concessions as late as the eleventh century (Hubert op. cit. 81 & 103). The complexity of the legal situation here probably owes something to the parallel existence of diverse law codes, with some cases decided by civil, some by canon law (Leicht, 1947, 567ff).

1.2 Church Funding and Administration of Building

The funding, building and dedication of public buildings in Rome, as anywhere else in the Empire, had been an imperial prerogative since the earlier laws of the Digest and, in theory at least, remained so until the end of the exarchate in 751 (CICD L, 10, 3). All evidence regarding the situation in Rome, however, shows that from the start of our period the Church was taking an ever-increasing role in administering and funding the maintenance and construction of public buildings. Here we will consider the development of this papal jurisdiction.

Churches in Rome, although considered as public buildings in the Corpus Iuris Civilis, were effectively under the sole administration of the papacy from at least 500 AD
(CICC I, 2, 7). Even in cases where the initiative and funding for building came from non-
ecclesiastical sources, the pope would oversee the budgeting of the project and would not
authorise consecration until satisfied that adequate funds had been set aside for mainte-
nance (LD XI & XIX). Dedicatory inscriptions - even of private foundations - would
always name the ruling pontiff first (Krautheimer, 1980, 34).

We have noted that the care of the city walls and aqueducts remained the duty of
the civil administration at the start of our period. The first papal interventions on these
came in the early eighth century with Sisinnius', Gregory II's and Gregory III's reconstruc-
tion of the Aurelianic Walls, under Hadrian I the major aqueducts were restored (see
chapter 5 for these). However, there are hints that the papacy was involved in less sub-
stantial maintenance of these structures even earlier. The Cambridge and Canterbury
sylloges preserve an inscription of pope Symmachus regarding works carried out at Porta
S. Petri: "Antistes portam renovavit Simmacus istam / ut Rome per eum nichil esset non
renovatum" (Silvagni, 1943, 97). Given the contemporary intervention on the circuit by
Theoderic, and also the king's methods of encouraging cooperative building ventures, we
should imagine that the Church here was working in conjunction with the secular admin-
istration (suggested with regard to Symmachus' church-building projects by Dulaey, 1977,
10-1). The grandiose wording of the inscription, however, remains unusual at so early a
date. Secondly, we have evidence that the papacy was maintaining its own water-supply
to various church establishments. This is discussed in 5.2.1 & 2. Suffice here to say that
the works of Symmachus, John I, Honorius I and Gregory II concerned only branch lines

12 The compilation date of the complete Liber Diurnus is generally considered to be the late eighth
century (Duchesne, 1891, 5); these specific clauses, however, have a much earlier origin and mirror
almost exactly the wording of various Novellae, as well as letters of Gregory I (CICN V, 1 - 535 AD;
LXVII - 538 AD; CXXXI, 7 - 545 AD; Reg. II, 9 - 591 AD; VIII, 5 - 597 AD).

13 The contrast with areas where a stronger Byzantine influence was exerted is well-illustrated by the
dedicatory inscription of S. Maria Assunta at Torcello, which names the reigning emperor (Heraclius)
first, followed by the exarch, then the provincial Magister Militum, and only mentions the consecration by
bishop Maurus in the last line (Pertusi, 1962). The Magister Militum, Mauricius, appears to be the private
founder here; he has been tentatively identified with the official who later held the post of Chartularius in
Rome (Pertusi op. cit. 22).

14 But not unheard-of: there exists a slightly later inscription from Masticana, North Africa, which
records the restoration of city walls by the bishop Faustinus whilst making no reference to the emperor
from the main aqueducts and should be considered as affecting private church supplies of the "jus aquae" type (CTh XV, 2, 2; CICC XI, 43, 5; cf. Var. IV, 31 where it seems the bishop of Vercelli had petitioned Theoderic to work on the local aqueduct, probably to supply a church establishment - B. Ward-Perkins, 1984, 145-6).

The papacy took a more substantial role at an earlier date in buildings connected with the ancient annona. In the sixth century we hear of both state and church granaries, although the former are already passing into private hands (Var. III, 29; Gregory of Tours X, 1). The precise date when the church grain dole became the sole supply for the city is unclear. There is a huge literature on the subject, but here we are concerned only with the question of the control of actual buildings. To summarise, it seems that despite the existence of a Praefectus Annonae in Italy up to at least the time of Gregory I, and the provision in the Pragmatic Sanction for a continued state annona, the Church in Rome was the chief controller of the supply from the beginning of our period (Sjoquist, 1946, 122-34; Bertolini, 1947; Richards, 1980, 88-9; Arnaldi, 1986; PS 22). Laws from the Justinianic Code and the Novellae in particular demonstrate the Church's role in the distribution of the annona throughout the empire, and implicitly its use of the former state granaries (CICC I, 2, 12 - 454 AD; CICN VII, 8 - 535 AD; CXXVIII, 16 - 545 AD). By 684 in Rome the church granaries were supplying, or perhaps were themselves superseded by, the diaconiae (LP LXXXIII, 5). These buildings were all ancient structures, converted to church use.

This brings us to the question of the control of disused public buildings, and when this too passed from the emperors to the popes. It has been noted that if there were any clear legal change it must have occurred between Constans II's spoliation of "all the city's bronze decorations" in 663 and pope Hadrian I's permit to Charlemagne to despoil the palace of Theoderic at Ravenna in c.787 (B. Ward-Perkins, 1984, 205). Earlier papal exercise of such rights is suggested by Domnus' use of travertine from the Meta Romuli to pave S. Peter's atrium in 676 (Mirabilia, ed. Nichols 76; Mallius in VZ III, 431), and the re-use of a Republican temple for the oratory of S. Gregorio Nazianzeno under pope Zacharias (741-52; see 4.1, #11 below). However, certainty over the precise date of this
appropriation of property rights is impossible owing to the lack of consistent textual
notices: for example, we hear nothing of permits requested for Felix IV's conversion of
SS. Cosma & Damiano in the 520s, nor for Honorius I's S. Adriano. The picture is further
complicated by the fact that the Church was not required to obtain permission to interfere
with buildings on its own property (CICN VII, 3, 2 - 535 AD; CXX, 1, 2 - 544 AD; this
might explain the conversions of the two round mausolea at S. Peter's by popes Symmachus
and Stephen II). Furthermore, a law of Anastasius laid down a forty-year statute of
limitations for lands appropriated from the public domain, including buildings thereon
(CICC XI, 61, 14). We cannot therefore be sure of the precise legal status of all structures,
nor that the Roman laws were followed to the letter in all cases; the most we can say is
that nothing more is heard of imperial rights over Rome's public monuments after Con-
stants' visit.15

We have now seen the papacy assuming responsibility for building rights in all
spheres formerly controlled by the emperor: churches, city walls, aqueducts, granaries and
all disused public monuments. Such encroachments coincide with the dwindling efforts of
the civil powers discussed in 1.1. It seems that the Byzantine administration, whilst
unhappy with any flagrant contraventions of the Corpus Iuris Civilis, accepted this papal
activity resignedly, perhaps even relieved at any saving in its funds which were needed
above all for the army (Richards, 1980, 86-8 describes Gregory I's altercations with the
civil authorities over papal encroachments in defence and provisioning). Indeed, the
Corpus itself had already accepted and regulated the role of the Church in many aspects of
civil administration: Justinian's Novella CXXVIII of 545 had placed bishops on the
regional committees which oversaw cities' building funds and the appointment of the
funds' tax collectors; Novella CIL of 569 allowed them a role in petitioning for the ap-
pointment of provincial administrators. Both of these measures appear in chapter 12 of the

15 Two late exceptions might be the references in the Liber Pontificalis that Gregory II "had issued a
decree" to repair the city walls ("huius civitatis muros restaurare decreverat" - XCI, 2), and that the
columns for S. Peter's were "concessas" by the exarch Eutychius (XCII, 5). The decree might represent an
application for permission to the civil powers, or its acceptance (alternatively, it might be an example of
the papacy's blatant appropriation of imperial prerogatives at this stage - that Gregory issued the decree in
imitation of imperial practice); Eutychius' concession might represent a permit for spoliation of the
columns from a standing building.
Pragmatic Sanction; chapter 19 places the pope on a par with the senate in overseeing standard weights and measures.

The projects controlled by the papacy which we have considered, however, were financed with church, not state, funds. And the church of Rome was in an excellent position to provide such finance. Its wealth was drawn principally from the vast "patrimony of S. Peter", huge estates donated by Constantine and subsequently added to by gifts from the imperial family and other, private, benefactors (Richards, 1980, 126ff). Krautheimer has estimated that Constantine's bequest would have furnished an annual income of the present-day equivalent of 150 million dollars (1980, 20). Many of these estates were in Africa, Gaul, Dalmatia and other areas lost in the invasions of the sixth and seventh centuries, but at the time of Gregory I the papacy was the greatest landholder in Italy and probably remained so for the next four hundred years; it has been calculated that the Church owned one sixth of all land in Italy during the eighth century, increasing to a third in the ninth (Partner, 1972, 6ff; Brown, 1984, 176; precise solidi revenues are suggested by DeLogu, 1988b, 277ff). Other sources of revenue included a vast tourist trade inspired by relics, and the export of books (Gregorovius, 1894 III, 73). Finally, there were the gifts of foreign rulers (see 1.3).

From at least the time of pope Simplicius the revenue of each see in the west was in theory divided into four and apportioned to the bishop, the clergy, for charity, and for the buildings (Jones, 1960, 91; PL 58, ep. 3). The system was upheld by Gregory I, who specifically mentions the quarter allotted to the "sarta tectis", and it is maintained at the end of the seventh century in the Liber Diurnus (Reg. IV, 11; V, 48; LD LXXIV). As with the civil budget's "tertia parte redibus publicis", there is nowhere near enough evidence to tell if this division was precisely adhered to; if it had been, the funds at the disposal of the popes for the care of Rome's buildings would have been immense. Apart from one quarter of the patrimonial income, all private bequests were added to the central fund and included in the fourfold division.\footnote{16 On the question of such "alienation" see Pietri, 1966, 135-9 & Arnaldi, 1982, 26ff. The centralised fund was in place from the time of pope Symmachus.}
The cost of new building and maintenance, very simply, was that of materials and labour. Where possible, materials were obtained for free. Gregory I tells Eulogius of Alexandria that he will not charge him for supplies sent for ship construction "because we do not buy the timber which we send" (Reg. VIII, 28). As we shall see in 2.1, the timber came at this time from church estates in Bruttium; costs were incurred, however, by the gift sent to duke Arogis to allow transport of the materials through Lombard territory (Reg. XII, 126). Hadrian I solicited gifts of timber and lead from Charlemagne for the roof of S. Peter's (CC 65 & 78). In general, however, payment had to be made. Gregory I paid for 1500 lbs of lead to repair monastery buildings outside Rome, in Campania (Reg. I, 48); Gregory III paid for the lime used in the reconstruction of the city walls (although from his own, not church, funds - LP XCII, 15); and Hadrian I expended "up to 100 lbs of gold" for materials, as well as wages and rations for the workforce, on a similar intervention (LP XCVII, 52). The subject of labour will be considered in chapter 3; here we should state that, although Hadrian I's is the only clear reference to wages being paid in Rome during our period, the very existence of craftsmen in addition to unskilled labourers implies that the former always received wages for their work.

The actual cost of a new building in Rome at this time is unknown. The (perhaps fanciful) yardstick for a particularly splendid church is the 26000 solidi which Agnellus claims for S. Vitale in Ravenna (LPR 59). By way of comparison, the purchase of a monastery in ninth-century Ravenna was 200 solidi (Gonin, 1933, 18); a palatial house in contemporary Rome was bought by the emperor Louis II for 800 lbs of silver, that is 4800 solidi (Hubert, 1990, 183). Hadrian's reconstruction of the Aurelianic Walls, above, would amount to 7200 solidi (assuming 72 solidi = 1 lb of gold, and a 1:12 gold-to-silver ratio for Louis' house).

We are better-informed on the provisions made for maintaining buildings. As Jones observes, "a new church was a doubtful blessing unless it was furnished with sufficient rents to pay for its repairs and maintenance, including the lights and the salaries of the
clergy" (1960, 87). Property seems to have been the prime means of funding such costs. The Liber Pontificalis provides detailed lists of such endowments made by the fifth-century popes for various churches in Rome, and such measures were followed by private founders - indeed, they were obligatory according to both civil and canon law (CICN VI, 8; LXVII; CXXXI, 7, 9 & 10; LD XI). Vast estates were granted to the great basilicas of S. Paolo fuori le Mura and S. Peter's by Gregory I and Gregory II respectively, simply to supply the oil for their lighting (Reg. XIV, 14; MEC XIV, 1). Within the city, it seems that individual churches were maintained by the rents of local houses in their possession: Gregory I made such provision for the re-dedicated S. Agata dei Goti, and Sergius I set aside houses in the fourth ecclesiastical region to subsidise the upkeep of S. Susanna (Reg. IV, 19; BAC 1870, 93-4). The same system was still being recommended by pope Formosus, this time for the parishes of Rheims, at the end of the ninth century (Flodoard, Hist. Rem. IV, 2).

From all this it appears that the fourfold division was by no means the sole method of finance for centrally-funded church buildings. It may well have furnished the initial cost of a new project, but, once built, the foundation was expected to be self-financing. In successful cases it seems that the careful management of property led to some institutions setting themselves up as building entrepreneurs in their own right. When the monks of SS. Stephanus & Caesarius petitioned Hadrian I for permission to rebuild their monastery at S. Paolo fuori le Mura it was accepted that they would pay for the work themselves (Schuster, 1904, 196). The private property boom of the late tenth century was organised almost entirely by the richly-endowed monasteries established by Alberic and his circle (Hamilton, 1962; Hubert, 1990). Conversely, the innumerable references in the Liber Pontificalis to papal restorations of all manner of buildings would betoken extraneous finance, most likely furnished from the central fourfold division.

Regarding the church personnel which directed building projects, it is difficult to detect a clearcut hierarchy of specific functionaries of the sort which, for example, still existed in the Ostrogothic civil administration. Isidore of Seville outlined such a system -
with the archdeacon and primicerius responsible for bringing necessary church repairs to
the notice of the priest and the oeconomus overseeing the actual work - but there is no
evidence for this being followed in Rome (Letters I). Noble summarises the city's church
administration, divided according to the seven ecclesiastical regions, each with its own
subdeacon and deacon who were in charge of charitable services and church property
(1984, 217-9). Nowhere in the texts do we find a post which had sole - or even specific -
charge of building projects. We are left to theorize, rather vaguely, that either such posts
did exist, but evaded mention in the sources, or else that building works were organised by
recognised church personnel such as priests, deacons and subdeacons; the fragmentary
evidence on this question will be considered in more detail in chapter 3.

1.3 Private Funding

We have mentioned Theoderic's system of financing public works through coop-erative ventures with what might be termed the private sector. Such a reliance suggests
that the private building industry was an effective entity at the start of our period. The
many clauses in the Theodosian Code outlawing the private takeover and reconstruction
of public buildings, however, show that this industry had not always enjoyed official
sanction. Theoderic's reversal of some of these laws represents the most original measure
of his building policy (for example, Var. III, 29, which over-rules CTh XV, 1, 12; Var. IV,
24 over CICC VIII, 11, 20).

The Variae give the all-purpose permit for such private take-overs, the Formula de
Competitionibus (VII, 44). It concedes the property rights of dilapidated public structures,
free of charge, to any person who will undertake to restore them, preserving for the
government only the more valuable building materials. Such a policy was advantageous to
the civil administration since it removed expensive, decaying buildings from the public
expenditure whilst preserving the beauty of the city (B. Ward-Perkins, 1984, 209). The
entrepreneurs benefitted due to the apparent ease with which such permits were handed out, and above all because such possession was free of charge. Finally, the inhabitants of such buildings as the Porticus Curva could enjoy the privilege of living in grand old public monuments (see chapter 6 for a discussion of such housing).

The Gothic Wars seem to have put a sudden end to both Theoderic's policy and the burgeoning private sector on which it relied. Totila's attempt to encourage the rebuilding of the city, especially the decimated Trastevere quarter, by the same means met with complete failure: "but these Romans, being reduced to the status of slaves and stripped of all their money, were not only unable to lay claim to the public funds, but could not even secure those which belonged to them personally" (Procopius V, 279). The Byzantine sources discussed above include no provision for private conversion of public property. The Summa Perusina, on the contrary, repeats the old laws of the fifth century on the question (VIII, 11, 13 & 19).

As usual, we are better-informed on the subject of ecclesiastical projects. Modern historians tend to emphasise the secular motives for such activity: that it was due to "fashion or status-seeking" (Brown, 1984, 183), that it was a means for rich families to set up political power-bases within the church (Morgheni, 1928, 201ff), or simply represented a form of investment (Pietri, 1981, 430). Genuine religious motivation - whether in the hope of intercession or (if the building were a xenodochi or hospital) to help the needy - must have played at least an equal part (cf. the comments of John Chrysostom cited in Deichmann, 1951, 15). The evidence for new private foundations, as well as gifts to existing institutions, is considerable.

The most notable private donors of the earlier part of our period are the Gothic Magister Militum Flavius Valila, who gave over the basilica of Junius Bassus to pope Simplicius for conversion to a church and also built a church at Tivoli which he endowed with many estates and furnishings (ICUR II, 436; Charta Cornutiana in LP ed. Duchesne I, cxlvi), and two sixth-century noblewomen, Galla and Barbara, both termed "patricia". To
Galla, the tenth-century historian Benedict attributes the building and endowment of many rural churches and monasteries, including his own at Mount Soracte (Chronicon 6b); in Rome she was responsible for the conversion of her own house to the church of S. Maria in Portico at the time of Theoderic and at least an endowment to the monastery at S. Peter's which came to bear her name, S. Stephanus cata Galla Patricia (sources for the church in Pericoli, 1879, 40-5; for the monastery, Dial. IV, 13). Barbara, a contemporary of Gregory I, is generally believed to have founded the monastery of S. Andrea cata Barbara Patricia at S. Maria Maggiore (LP ed. Davis, 1992, 4).

These examples, of course, may not reflect the wider picture. If we were to base our summary of private foundations on their documentation in the Liber Pontificalis, we should record their decline after the fifth century. Brown also notes the rather insignificant endowments made for such foundations at the time of Gregory I (1984, 182-3). This general abatement during the sixth century could owe its causes to various factors: the emigration of the nobility to Constantinople, the disasters of war and epidemic, and also the Church of Rome's right to transfer private bequests from their intended destination to the central funds, which might have discouraged such gifts (see note 16, above). However, the sources do not necessarily give a balanced picture. This is most notable in the Liber Pontificalis' apparent abandonment of the recording of private foundations. The fifth-century papal biographies seem careful to distinguish between privately-financed buildings simply dedicated by the ruling pontiff, and works actually initiated by the Church. After the pontificate of Symmachus this practice ceases. It is interesting to compare alternative accounts of the building of the first church of S. Martino ai Monti: the anti-Symmachan Laurentian Fragment states that "(Symmachus) built and decorated the church of S. Martin...with the money of the illustrious Palatinus, and at that person's request, he dedicated it" (LP ed. Davis, 1989, 99). The official Liber Pontificalis has: "(Symmachus) constructed the basilica of SS. Silvester and Martin from the ground up" (LIII, 9). And from this point on, the Liber Pontificalis ceases to make reference to any privately-funded building. That such private building did continue we know from other sources (see below); furthermore, private foundations do actually appear in the text, but after their construc-
tion, when they receive papal gifts. Thus S. Andrea cata Barbara and S. Stephanus cata Galla are listed in the record of donations made by Leo III, having had no mention made of their original construction (LP XCVIII, 70-81). It is thus not unlikely that many of the other edifices in the same list, of which we have no foundation details, were built by private patrons. These fifteen or so are chiefly monasteries or small chapels, often with an appellation such as Dulcitus, Julia, Ambrose, or Formonsis - probably the names of their founders (cf. SS. Sergius & Bacchus in Callinicum, in 1.1 above). Regarding Brown's observation, it should be stressed that most of the paltry or failing foundations he refers to are outside Rome. Apart from Barbara's contemporary monastery, the privately founded xenodochia of Boniface seems to have had a long life, perhaps surviving to Mallius' time (Reg. IX, 63 & 130; Bertolini, 1947, 56).

The eighth century in Rome is generally seen as a time when the papacy re-asserted its rights over alienated estates, taking back rented lands to establish the domuscultae (Noble, 1984, 246ff). Against such a background, private donations of land to these institutions are seen in terms of papal coercion rather than voluntary munificence (LP XCVII, 63 & 77; ed. Davis, 1992, 148; Christie, 1991, 6). We learn of less controversial private endowments from inscriptions: of the brothers Eustathius and David, recording their gifts of farms to the diaconia of S. Maria in Cosmedin, and, at the lesser end of the scale, of the majordomus Anastasius who offered vines, animals and a bed to S. Nicola in Carcere (Lestoquoy, 1930, 277-9; MEC XXXVI, 7). Such a donation would hardly subsidise substantial maintenance. However, one of the most ambitious building projects of the century, the construction of the basilica of S. Angelo in Pescheria, was a wholly private work of the primicerius Theodotus. We learn of this only through the surviving inscription, which states that the church was built "a solo...pro intercessionem animae sua / et remedium omnium peccatorum" (MEC XIV, 3). The mention of the reigning pope ("temporibus domini Stephan huniorus papae") may be the only indication regarding the

17 Two of the xenodochia on the list, the "Aniciorum" and the "a Valeris" were almost certainly founded by the late antique families of these names, perhaps before 500 AD (LP ed. Davis, 1992, 218); the Boetiana monastery of LP LXXX, 2 has recently been claimed as a foundation of the philosopher Boethius and located next to the supposed site of the xenodochia Aniciorum near the Largo Argentina (Santangeli Valenzani, 1994).
legality of the work, which must have involved the partial demolition of the propylaeum of the Porticus Octaviae (see 4.1, #12 for a discussion of the archaeology and architecture of the building).

We hear of no private building works during the period of the so-called Carolingian Renaissance (although there is the donation of land to S. Maria Maggiore by the Greek Flavia Xantippe during the reign of Gregory IV - Gray, 1948, 100). But with the decline of papal power from the end of the ninth century the Roman aristocracy emerges as the greatest patron of building in the city. In fact it is during the pontificate of John VIII, at a time when the papacy was expending vast amounts of its income on fighting (and buying off) the invading Arabs, that we detect the first signs of what may be termed dynastic building projects18. Two inscriptions from the Temple of Fortuna Virilis indicate that this was converted to the church of S. Maria de Secundicerio by the judge and Secundicerius Stephanus and his family (Marchetti-Longhi, 1926, 94-9; Osborne, 1988, 211 for a precise date and identification of the names). The line "Praesulis octavi, nunc tempore iure Johannis" in the principal inscription might imply that it was still the reigning pontiff who authorised such a work. John's pontificate also saw the foundation of S. Maria in Castro Aureo by four aristocrats, named in a much later bull of Celestine II as Gratian, Gregory, Rosa and Imilla (Manacorda et al, 1994, 639); shortly after, during the reign of Hadrian III, one Paul "nobilissimus vir" donated land to the church (ibid.).

A diploma of 901 records the presence of two judges, Stephanus and Theophylact, at a tribunal of Loibus III (Cecchelli, 1942, 5); it is very likely that this is the same Stephanus of our temple conversion. This professional connection may explain the burial of two of Theophylact's children in S. Maria de Secundicerio between 890 and 920 (inscription in MEC XXXIX, 4). According to a manuscript from the archive of S. Maria in Via Lata, Theophylact and his wife Theodora were also responsible for a major reconstruction of that church (S. Maria in Via Lata) during the reign of Sergius III (Fedele, 191219). They

18 Physical evidence for most of these foundations will be considered in 4.2; housing is treated in chapter 6.
19 Fedele accepts the tradition, but gives no date for the manuscript; he believes the intervention amoun-
also rebuilt their family house on the Aventine, as we learn from a fragmentary inscription found at S. Sabina (Gray, 1948, 142). A small but not insignificant illustration of the character of such private patronage is Gray's suggestion, based on the palaeography of the inscriptions, that Theodora "employed and encouraged the same mason" (ibid.).

The couple's grandson, Alberic II, acted as an independent ruler of Rome from 932 until his death in 954, assuming the title of Princeps and even minting his own coinage. The effects of his political and economic policy on building concerned above all the monasteries. His reforms in this area seem to have had the objective of limiting the influence of Farfa and increasing his own family's power base in the city at the expense of other dynasties (Rota, 1956); pious motives cannot be ruled out (Hamilton, 1962, 50). Entirely new foundations by Alberic and his circle of advisers and relations include S. Maria in Aventino (converted from Alberic's own family house, presumably the same building restored by his grandparents), S. Cyriacus in Via Lata (by Alberic's cousins, perhaps within their own house), S. Maria in Monastero (built by his cousin Marozia and her son), S. Cosimato (built by Alberic's chief adviser Benedict Campanius on his own estates) and S. Peter in Horrea (by his associate Baldwin; sources in Hamilton op. cit. 51-8). At the same time many other monasteries were endowed and rebuilt (S. Andrea in Celio, S. Erasmo, SS. Stephanus & Caesarius, S. Agnese fuori le Mura and S. Lorenzo fuori le Mura - Hamilton op. cit. and Rota, 1956, 11). It is also possible that Alberic assumed the prerogative of handing out rights over ancient buildings during this period: the construction of S. Peter and S. Cyriacus would have involved at least the re-working of antique horrea and parts of the Diribitorium respectively; and the contemporary foundation of the monastery of S. Basil amongst the ruins of the Temple of Mars Ultor was probably set up by concession of Alberic, who owned the surrounding property (Hamilton, 1961, 11).
Finally, an inscription recording a late restoration of the church of S. Eustachio by Alberic's widow Stefania in 991 would go well with the dynasty's supposed antagonism to Farfa (since the monastery was an inveterate litigant against S. Eustachio - documents in Lori Sanfilippo, 1980, 18; inscription: VZ II, 180).

By the end of the tenth century it would seem that all new building in the city was carried out exclusively by the competing noble families and their associated monasteries. Various members of the Crescentii were responsible for the private chapels of S. Barbara dei Librai and S. Salvatore in Thermis, located within the ruins of the Theatre of Pompey and Baths of Nero-Severus respectively, and the (probably) new construction of S. Trifone in the Campus Martius (see 4.2 for discussion of all of these). The foundation documents of the latter have survived, and show that, as in the days of Gregory I, the ruling pontiff still gave the permit for new church construction (Huls, 1976, 336-7). The builder, the judge Crescentius, already owned the land, and he included amongst the endowments for the church's upkeep the port duties from an adjacent stretch of the Tiber bank, a permit to construct a water-mill, and more property within the city. Other private foundations of this period include the church and monastery of S. Sebastiano on the Palatine, constructed by the doctor Peter on the site of the Temple of Elagabalus (Ferrari, 1957, 220ff), and various projects by the family of the rich butcher Beno de Rapiza. These are known by their frescoes, all of which adorn buildings which the family endowed at the turn of the tenth century: S. Clemente, the oratory of the Seven Sleepers, S. Urbano, and S. Salvatore de Militis (BAC 1863, 11 & 1864, lff; Lanciani, 1897, 335; Rava, 1930, 174-5). The last three monuments - a pagan sepulchre, a mausoleum or temple, and an insula respectively - are unknown as churches prior to the date of their fresco cycles, and were almost certainly converted by the family.

It is only in the tenth century that many of the city's monasteries began to preserve property documents concerning the lease and sale of houses and vacant plots. This enables

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20 S. Urbano's is the only fresco-cycle to bear a date (admittedly copied in the seventeenth century - Williams, 1987, 226): 1011. This is not taken into account in any discussion of the S. Clemente cycle, which is generally assigned to the late eleventh century (Barclay Lloyd, 1986, 201).
us to return to the subject of domestic building after the hiatus of around four hundred years since the Gothic War. Prominent amongst the urbanising institutions were Alberic's foundations, such as S. Cyriacus and S. Cosimato. The scanty documents to survive from the tenth century contain very few notices of actual new building; most concern leases of existing buildings. The payments which the monasteries received were mostly in kind - produce from the olive and vineyards of the properties themselves, and the rights of burial (with accompanying expenses) of tenants and their families (Hubert, 1990, 131ff, 297). The typology of this housing will be considered in chapter 6; it will be seen that although housing generally consisted of re-worked ancient structures, there was continuous activity over the entire period. This in turn suggests a constant, even if small-scale, private sector of property developers and builders, something which would anyway be expected even if there were no textual evidence. Survival of similar documents to the tenth-century Roman examples in Byzantine Ravenna, as well as the eighth-century document regulating prices for sundry building works in the Lombard territories, would also serve as parallels for the situation in Rome during the intervening period (Breviarium Ecclesiae Ravennatis; De Mercedibus Commacinorum in Blume, 1869, 147-9).

The final category of private building finance is that supplied by rulers of foreign states. In its clearest form this consisted of the actual construction of new churches by newly-converted peoples such as the Anglo-Saxons (S. Maria in Sassia, built by Ina in c.727 - see 4.1, #7; Fra Santi also attributes the first church of S. Trifone to an Anglo-Saxon of that name, in 717 - 1595, 17), the Lombards (S. Iustinus, built by Ansa in c. 773 - de Waal, 1897, 4), the Frisians (SS. Michele & Magno, built before 854 - op. cit.) and the Hungarians (S. Stefano degli Ungari, probably a reconstruction of c. 1007 - see 4.2.2). In addition, they established their own colonies in the city - or rather in the Vatican area, outside the walls - where were built hostels and houses for the permanent residents of their "scholae". The Anglo-Saxon tax known as Peter's Pence originated specifically to fund the construction and upkeep of these buildings, and initially comprised 1 denarius from each householder in Wessex (Matthew of Paris, cited in Fabre, 1892, 160). Standardised under Hadrian I, it seems that the payments soon came to form a more general, papal income;
DeLogu calculates their annual value at this time as c. 108 lbs of gold (1988b, 285).

Such payments were dwarfed by the gifts of the Carolingians under Charlemagne, which were themselves drawn from the king’s Pannonian war spoils (King, 1987, 127; Einhard 52). These, however, were by no means a constant source of papal revenue, tailing off entirely after the mid ninth century (DeLogu op. cit. 287-91). Specific building works instigated by Charlemagne were the Franks' own colony and church of S. Salvator (De Waal op. cit. 6-8) and the materials assembled for the reconstruction of S. Peter's (CC 65 & 78). Apart from the funding of the Leonine Walls (see 1.1, above), the only known contributions of later western emperors to Rome's building works are Otto III's S. Bartolomeo, built at the very end of the tenth century on land which already belonged to the monastery of S. Alessio, and the founding of the monastery of S. Salvator de Marmorata by the emperor's Greek wife in 982-3 (Hamilton, 1965, 294 & 1961, 17).
Chapter 2: Materials

The building materials used during the early middle ages in Rome were precisely those of the Empire, whose source, supply and application have been dealt with in detail by Lugli, Blake and Adam. The great difference in this period is that all the materials except timber were produced almost entirely from the spoliation of older buildings and storehouses. This chapter will look at the source, supply and use of timber, metal, building stone, mortar and concrete, brick and tile, and finish by making some observations on the organisation and supply of spolia per se.

References to building materials in the texts are by no means consistent. If there is a general rule it is that only those items which are deemed urgent or difficult to obtain will be referred to. Thus timber, the one product foreign to Rome, is a recurring subject in the letters of Gregory I and Hadrian I, and the eighth and ninth-century biographies of the Liber Pontificalis. The latter will also emphasise whatever unusual, expensive or generally sought-after supplies were obtained by individual popes: metals and coloured marbles are a favorite subject. Conversely, the relatively humble and plentiful materials of brick and tile are never mentioned with reference to the larger church projects, although in the context of a private property-contract tiles are one of the most important goods listed. There are of course exceptions, the most notable being Agnellus of Ravenna, who shows an almost archaeological interest in lime, gravel, sand, rubble, bricks (bessales as well as latercula) and varieties of timber. In a more general context, Isidore of Seville's epitome of earlier technical texts in his Etymologiae seems to betray the emphasis of his own time in what he chooses to include and exclude from Vitruvius: he seldom refers to construction in brick, concrete or stone, but concentrates in quite unusual detail upon carpentry.

The archaeological and architectural evidence is also incomplete. Most emphasis has been given to the analysis of church-walling, principally with a view to establishing
diagnostic features for dating. Little has been done on the provenancing of brick, tufa and mortar\(^1\) - and absolutely nothing on concrete. Work on tile has concentrated chiefly on the analysis of stamps, which are few in the early medieval period - certainly no kilns have yet been excavated in Rome. There is much published material on the use of marble, chiefly the stylistic examination of sculptural and decorative elements, and if all the archaeological data on the sources of marble spolia were assimilated interesting results might be obtained on supply networks within the city. There is very little evidence for the architectural use of metal in early medieval Rome. Finally, and perhaps most surprisingly, in all the years of continuing restoration and replacement of church roofs, little notice has been taken either of the original configuration of the timbers or of the varieties of wood used.

2.1 Timber

There is no immediate source of substantial building timber in Rome. In the middle ages timber was transported to Rome by sea and river from the rest of Italy as it had been during the Empire. Because the dominant type of monumental architecture was the Christian basilica, spanned by timber trusses, the principal demand was in roofing. Considering the great number of new-built churches, as well as the even larger basilicas of earlier centuries and the few classical buildings which were maintained by the popes, the supplies needed must have been immense. The wider spans of nave roofs whose repair or new construction is attested in the Liber Pontificalis are: S. Paolo fuori le Mura, 25m; S. Peter's, 24m; S. Adriano (the Curia Senatus), 19m; S. Giovanni in Laterano, 17.5m; S. Maria Maggiore, 16m; SS. Quattro Coronati and S. Martino ai Monti, 15m; S. Prassede, 14m; S. Balbina, 13m; S. Pancrazio, 12m (CBCR I-V; Mancini, 1966). By way of comparison, the greatest lengths of squared timber listed in Diocletian's price edict were 29.5m

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1 Dott. Stefano Coccia tells me that chemical analysis of mortar from Portus has proved an impossible task, with samples from even the same walls producing different chemical characteristics (cf. Wetter's conclusions, 1979). There has been some success in carbon-dating lime mortar from the walls of Thermopylae; drawbacks include a wide range of possible error (plus or minus 50-195 years), the large samples needed (at least 2 kg.), and the expense (Cherf, 1984).
for softwoods and 8.25m for hardwoods (Meiggs, 1980, 189 gives dimensions converted from cubits to English feet by Erim & Reynolds, 1970, 125). The widest space covered by a timber roof in imperial Rome was the Diribitorium, whose beams were just over 39m long and 15cm thick; when it collapsed following the fire of 80 AD it remained unrepaired even in the time of Cassius Dio, who related the fact in the same apocalyptic tone as would the writers of the Liber Pontificalis when describing the sorry state of certain churches before papal restorations (Meiggs op. cit. 194).

The Liber Pontificalis, in fact, never gives any details of the ex-novo construction of roofs for new churches; all references to timber roofing come in the many descriptions of restoration. There is at least one campaign per pontificate, and in the case of the great builder Hadrian I, twenty-three. Not all such works, however, affected the actual roof trusses. The text distinguishes between general repair of the roof or roofing (tectum, tegumen) - presumably signifying tiling, guttering, or any work on the soffit or coffering - and actual replacement of beams (trabes, trabes maiores, trabes magnis): "as for the porticoes on each side of this church, in which the beams were broken and the roof was close to falling, he put new beams in place and rebuilt and restored the roof itself" (XCVII, 57, transl. Davis; here, the aisles of S. Peter's are intended). Elsewhere, repairs which concern only the replacement of beams are followed a few years later by works which consist specifically of making good the tectum-tegumen (S. Maria Maggiore's and S. Giovanni in Laterano's beams replaced by Hadrian I, roofing finished by Leo III - XCVII, 70 & 74; XCVIII, 82 & 88).

It is also clear from these descriptions that even in the most ambitious projects entire roofs were not reconstructed wholesale. Probably for economic reasons, consolidation was preferred to the complete replacement of all the main beams. If, for example, we follow the works carried out at S. Paolo fuori le Mura over the course of the eighth century, we see just how laborious such a feat of engineering could be in the early middle ages. Sergius I was the first to repair the basilica since Gregory I; he replaced those beams which he found to be the oldest (LXXXVI, 12). Some twenty years later, after more of
the old beams had broken, Gregory II "roofed the greater part of the basilica" with new timbers brought from Calabria (XCI, 3; CBCR V, 100 judges this campaign to have concerned only the transepts). Very soon after, his successor, Gregory III, replaced another five beams and "checked over and restored the whole of the basilica's roof from the arch over the altar to the main doors" (XCII, 13; note again the distinction between specific truss replacement and a more cursory restoration). Around forty years later Hadrian I carried out his own survey of the basilica's roof and concluded that "the beams were ancient and in part likely to fall"; he began a huge project to replace 35 beams in the nave and restore the aisles (XCVII, 67). Some years later the project was being finished by Leo III when the earthquake of 30 April 801 necessitated a further restoration of the roofing above the main altar (XCVIII, 31).

When we turn to the question of timber type we are faced with the problem that no early medieval building in Rome preserves its original roof timbers (Giovenale, 1927, 258). From a variety of secondary evidence, it appears that the preferred hardwood was chestnut. Its introduction seems to have occurred well after the time of Vitruvius; it is first recommended as a building material by Palladius in the late fifth century (XII, 15; dating in ed. Martin). This would also explain its absence from Diocletian's price edict, which lists the hardwoods ash, oak and beech (Erim & Reynolds, 1970, 124). Italian chestnut has the advantage of being able to span a considerably larger space, producing beams up to 15m, as against oak's 9m (arch. L. Cherubini, pc; DeLaine, 1992, 155). The oldest beams observed in place in Rome's basilicas within the last hundred years were all chestnut: those surviving today in the nave of S. Giorgio in Velabro (c.11m; perhaps dating to Riario's fifteenth-century restoration - CBCR I, 247 & pl.33.1); those in the nave of S. Croce (c.11m - CBCR I, pl.24; assigned to the 1144 rebuilding - Paolucci, 1930, 523); in the nave of S. Maria in Cosmedin (7.25m; dating from c.1300-1670 according to Giovenale, 1925, 21); in the nave of S. Martino ai Monti (15m; Crostorosa assigned those he saw during the 1891 restoration to the basilica's original ninth-century construction - 1897, 202); in the nave of S. Agata dei Goti (10m; CBCR I, 8); and, considering surviving traces in the soffit of the porch of S. Vitale, probably here too (Matthiae, 1958, 74; the porch
span is 7m - CBCR IV, pl.18). Chestnut still grows today on the shores of Lake Bracciano, and texts cite the area as one of the principal sources of timber during the Renaissance (Meiggs, 1982, 382ff). The area was always within papal territory, and although there are no precise references to its supplying timber during our period, it seems most likely that it always furnished the chestnut discussed here (Bavant, 1979, fig. 3; cf. the possible existence of a domuscula around the chestnut woods to the northwest of the lake - Christie, 1991, 337).

For any span greater than 15m, softwoods would have been required. We have descriptions of the roofs of both old S. Peter's and pre-1821 S. Paolo fuori le Mura. The former was entirely replaced under Benedict XII between 1337 and 1341; Rutilio Alberini described the old beams: they were of fir, and one still bore the inscription "CON" (Lanciani, 1892, 138). Rondelet identified three types of roof truss at the original S. Paolo (claiming the oldest were of Leo III): all were constructed of fir (1838 III, 117). Prior to the Byzantines' confiscation of the southern papal patrimonies in 732-3 we can be sure that all such timber came from Bruttium. The great Sila forest here had been exploited since the late Republic; the most abundant supplies of fir were towards the south, around Rhegium (Meiggs, 1982, 247, 387, 462ff). Gregory I's Registrum preserves four letters sent in 599 to arrange for the felling and transport of twenty great timbers needed specifically for the repair of S. Peter's and S. Paolo (IX, 124-7; work which is not recorded in the Liber Pontificalis, incidentally). The labourforce - men and oxen - is to be requisitioned from the church estates managed by two local bishops and a lease-holder, the ex-prefect Gregory (IX, 125, 127). Considering that one of the addressees, Venerius, is bishop of Vibona, the timber would probably have been transported down the Savuto river to the Gulf of Euphemia. A certain amount of diplomacy was needed to encourage the Lombard duke of Benevento, Arogis, to relax his "actionarii" (perhaps customs agents or

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2 That is, if we identify Vibona with Bovensi in Calabria (LC I, 22) as opposed to Fabre's preferred Bovino, near Benevento (LC I, 35). The fact that the timber was coming from Bruttium would entail labour being requisitioned there, rather than some 170 miles away in Puglia. Wickham suggests use of the Crati river to the eastern coast (1989, 534); the position of our Vibona, as well as the fact that the richest supply of fir was to be found in the southern part of the forest, would favour the Savuto and Gulf of Euphemia.
frontier guards) along the route: the pope's letter promising him a gift was delivered by the Magister Militum, Maurentius (IX, 124 & 126).

The Liber Pontificalis states that both Sergius I and Gregory II used a similar source of timber for their repairs at S. Paolo (see above); but by the time that Hadrian I carried out his numerous repairs on the churches of Rome, the estates of Bruttium were in Byzantine hands, and they remained so for the rest of our period (Anastos, 1957, 23-7). The fact that church-building was able to continue, and even accelerate, up to the late ninth century suggests that alternative timber supplies were easily found. It should anyway be stressed here that, contrary to most other comments on this subject, it was only the handful of buildings with a span over 15m that needed the especially-long fir of Calabria. The most likely replacement source is the central Apennines, principally Umbria. High-quality softwoods were abundant here until recent times (Meiggs, 1982, 227ff). From a letter of Hadrian I to Charlemagne written in 779 we learn that the latter had agreed to supply the beams for the repair of S. Peter's (CC 65). The material for the coffering at least is specifically stated to be fir from the forests of Spoleto; the beams themselves were almost certainly drawn from the same place. Toubert gives a diploma of Anastasius III which states that timber for the "sarta tecta Matris Ecclesiae" was still being supplied from the Apennine Alps at this time (911-13 AD; 1973, 642). There is one slight suggestion that the new timber supplies fell slightly short of those from Calabria: some of the trusses at S. Paolo, assigned by Rondelet to Leo III's restoration, had their main tie-beam formed from two timbers, firmly jointed at the centre. Although there is no precise evidence dating these specific examples to the late eighth-century phase, such a technique would have been well-suited to the condition of the timber-supply at that time.  

All this has concerned chiefly the supply of timber for the beams of roof-trusses. In addition, varying quantities and qualities would have been needed for coffering, flooring, rafters and batons, door and window architraves, scaffolding, formwork for apses and

3 The source for this information is one of the carpenters who worked on the rebuilding of the new church's roof in 1850 (Munoz, 1940, 436 & fig. 1). Even if Rondelet's dating is accepted we should assign the original trusses to Hadrian I rather than Leo III (see p. 38, above).
vaults, as well as for church furnishings such as choir screens, railings, doors and benches. Finally, it is likely that some private housing relied more extensively on timber. Because, once again, archaeologists and restorers have failed to take note of the evidence which may have come down to us from the early middle ages, we are forced to rely on textual evidence - and if this is not wholly satisfactory even for church beams, it is still less so for subsidiary uses.

Much of the wood required for small-scale building projects and furnishings could be found nearer to hand. Renaissance projects such as ship-building and the construction of mechanical devices cited by Meiggs took their timber from forests as near as Praeneste, Anzio and the Via Laurentina (1982, 382ff). The supplies brought in by the popes discussed above were also adapted for other purposes in Rome, as Gregory I himself states (Reg. IX, 175; some he also exported to Alexandria for ship-building). Surviving architraves at S. Croce are of chestnut, like the beams (Colini, 1955, 156). The imported fir served for the basilicas' coffering as well as the beams (CC 65, above); again, it probably found other uses, such as the house "modo edificata abetis" near S. Maria in Via mentioned in a document of 1042 (Hartmann, 1895-01 I, 97). However, wood was not so abundant that high-quality timber could be afforded for such things as scaffolding, as the irregularly-spaced and sized putlog holes in most early medieval church walls testify (cf. the "dangerously-spaced" holes at Leo III's SS. Nereo & Achilleo and Sergius II's S. Martino ai Monti, which utilised small round saplings - CBCR III, 110 & 143). Even during the fourteenth-century replacement of S. Peter's roof, the decayed Constantinian beams were sawn up and re-used for planks to clad the rafters (Cerrati, 1915, 85). As one would expect in any era, left-over stock was saved for later use: the same project relied on old timbers stored at the Lateran (op. cit. 99), and off-cuts of cypress and chestnut from a workshop at S. Peter's were used during the twelfth century to prepare a rough frame for the ninth-century bishop's chair (Cagiano de Azavedo, 1972, 253).
2.2 Metal

With the exception of a number of lead aqueduct pipes there is a dearth of archaeological evidence for the architectural use of metal in early medieval Rome. Again, the bulk of evidence must come from textual sources, supplemented by examples from outside our area or timespan.

The chief use of metal in building was for roofing. Lead sheeting would serve, as it has done until recently, as a damp-proofing between the roof timbers and tiles, especially in vulnerable areas such as the valleys between the folds of the transept and nave of basilicas. It must have been for such a purpose that Gregory I agreed to pay for 1500lbs of lead to repair monastery buildings on an island in the Gulf of Gaeta (Reg. I, 48). During the second phase of Hadrian I's repair of the roof of S. Peter in 786 the pope reminded Charlemagne to send the arranged 2000lbs of "stagni", suggesting that a further 100lbs be requisitioned from each count of Italy (CC 78). "Stagni" here might mean either tin or white lead. Tin would have been a viable material for damp-proofing, but highly unusual in view of its rarity; it is more likely that lead was intended. A depiction of just such a use of the material seems to be intended in an eleventh-century drawing of S. Peter's, where lead flashing is seen beneath the tiles in the valleys of the quadriporticus (Picard, 1974, 871).

Domes might be entirely covered with lead sheets: the only references to the use of lead for roofing in the Liber Pontificalis concern the rotundas of SS. Cosma & Damiano, repaired by Sergius I, and the Pantheon, whose dome was sheathed in "chartis plumbeius" by Gregory III (LXXXVI, 13; XCI, 12). Such lead roofing sheets have been found in contemporary Ravenna at the basilica Ursiana, bearing the stamps of bishops Theodore (677-8) and John VII (723-32), and in Rome from the later middle ages and Renaissance (Stevenson, 1888, 442ff).

Perhaps the best-known use of lead in Roman times was for the conduit pipes of aqueducts. This continued in the early middle ages, and from the earlier part of our period
there are several examples of stamped fistulae: that bearing the name of Basilius Decius, found on the Aventine near S. Alessio (CIL XV.2, 7420, assigned to the Decius of Var. II, 32-3); one mentioning a consul of 471, found at the cathedral of Portus (Bull. Comm. 1878, 132ff); and a number from S. Lorenzo fuori le Mura, all with the inscription: "salvo papa Iohanne / Stefanis pp reparavit", assigned to pope John I on the basis of the praepositus Stefanis' appearance in another inscription of 526 (Marucchi, 1902). Other, less-precisely dated, inscribed fistulae from Rome include two which name their respective religious establishments (a "hospetalis S. Crisogoni" and an unidentified xenodochi - CIL XV.2, 7257-8) and one bearing a chi-rho, manufactured by an "officina agnelli" (Bull. Comm. 1878, 136). Of the many notices in the Liber Pontificalis of papal repairs of aqueducts, that regarding Hadrian I's work on the Aqua Traiana refers specifically to the pontiff "adding a great amount of lead" so that the conduit leading to S. Peter's atrium might function once more (XCVII, 59).

Copper served for guttering, as at S. Martino ai Monti where Crostorosa believed it survived until 1891; during the same restoration he spoke of the original iron ties used for reinforcing the roof-truss joints (1897, 202). There is a unique reference in the Liber Pontificalis to a reinforcement of the apse of SS. Apostoli by Hadrian I with iron bars (cancalis ferreis - XCVII, 50); the sockets for similar metal tie-beams survive in the columns of S. Sabina, here used to stabilise the nave colonnades (Wilcox, 1981, 49). The Liber Pontificalis also makes constant reference to the adornment of churches and palaces with "cancellos" of bronze, which must refer to metal barriers, gates and railings, often part of the liturgical furnishings, and as much ornamental as utilitarian (cf. the sixth-century openwork bronze window-frame from the crypt of S. Apollinare in Classe, which replicates the shield motif seen on so many contemporary marble choir-screens - Iacobini, 1990, 76 & fig. 12). Monumental doors of bronze were similarly prized. Lastly, although they have not survived nor been referred to in texts, nails would have been needed in great quantities, as well as similar fastenings for roof tiles (Picard's eleventh-century illustration of S. Peter's quadriporticus seems to show the tiles held with metal hooks - 1974, 871). Decorative marble sheets and the panels of choir screens were also fixed with metal
cramps and dowels: often the only evidence is holes left in the masonry - as in the arcades of S. Sisto Vecchio - but, in the base of John VII’s ambo at S. Maria Antiqua, the original lead dowels were preserved (Apolloni-Ghetti et al, 1944-5, 248; Rushforth, 1902, 90).

Having established the evidence for the architectural use of metal we should now consider its supply. Davies (1935, 63ff) has listed the areas in Italy where gold, silver, tin, lead, copper and iron were mined during the Etruscan and Roman periods, and there is no reason why it should have proved impossible for people of the early middle ages to continue the practice. However, given the complete silence of all the sources on the subject, and more importantly given the substantial notices of the re-cycling of metals in the period, it is almost certain that all architectural use of metal in Rome relied on spolia. Lead had been mined on Sardinia at least up to the fifth century, but we hear nothing from Gregory I on the subject, although he was greatly concerned with affairs on the island and organised various building projects there (Davies op. cit. 69; Reg. IV, 8-10). When he arranged for the replacement of lead in monastery buildings on the Eumorphian Island in the Gulf of Gaeta, he had it collected in Campania - where there are no natural lead deposits; the material here was obviously spolia. In addition to re-casting lead and bronze and re-forging iron, certain metal objects could be used again directly, with no re-working: the bronze roof tiles moved by Honorius I from the Temple of Venus and Rome to S. Peter’s, or the "great bronze decorated doors of wondrous size" transported from Perugia to the quadriporticus of S. Peter’s by Hadrian I (LP LXXII, 2; XCVII, 96).

The theft of architectural metal and bronze statues for scrap is well-attested. Under Theoderic it was thought necessary to assign two functionaries - the Architectus Publicorum and the Comitiva Romana - simply to prevent the theft of the city’s statues (Var. VII, 15 & 13). In exhorting the latter to be always vigilant, Cassiodorus clearly has in mind the danger to bronzes: "nor are the statues absolutely dumb; the ringing sound which they give forth under the thief seems to admonish their drowsy guardian." We have seen that the

4 I know of no later reference than Athalaric’s suggestion that a "chartarius" be sent to Bruttium to look into the possibility of extracting gold from the Rusticana estate - Var. IX, 3.
official concession-formula for abandoned public monuments retained the rights over any precious materials for the state: bronze and lead are mentioned specifically (Var. VII, 44). Elsewhere the Variae record the continued theft of metals from standing public buildings, notably aqueducts (III, 31). Such "removals" were endemic throughout the early middle ages: Honorius I obtained permission from Heraclius for his spoliation of tiles from the Temple of Venus and Rome, but it seems unlikely that the average craftsman or scrap merchant followed any official procedure; certainly the emperor Constans II set a bad precedent during his twelve-day campaign to remove "all the city's bronze decorations" (LP LXXVIII, 3). By the time of Hadrian I's repair of the Aqua Traiana, thieves had removed all the lead piping of the branch line to S. Peter's, leaving only the damaged portions (LP XCVII, 59).

The few surviving examples of new-made architectural metal objects - Hilarius I's inscribed bronze doors at the Lateran Baptistery, the stamped fistulae from Rome, the lead tiles from Ravenna - must presumably have been re-cast from such stolen scrap, although there is no certain proof in our period (Iacobini believes that the only new elements of Hilarius' doors were the actual inscription and the embossed crosses, beaten-on in copper and silver respectively - 1990, 73). The terminology in the Liber Pontificalis (fusis, fabrefactum) would suit both new casting and re-casting; references to Leo I's replacement of looted silverware with "conflatas hydrias", however, would suggest a re-working of metal on a smaller scale (XLVII, 6; cf. Delogu's observations on the melting-down of offerings to provide new church vessels - 1988b, 277). Later, during the 1337 re-roofing of S. Peter's, the account-books speak precisely of Roman workmen re-casting the lead damp-proofing from the old sheets (Cerrati, 1915, 90).

Archaeological evidence for metal-working in early medieval Rome is sparse. The most recent published material from the excavations at the Crypta Balbi reports the discovery of two pit furnaces bearing traces of the fusion of copper and bronze, perhaps dating to the eighth century (Sagui, 1993, 132; these might be placed in connection with nearby strata of metal refuse of similar date-range - AM 1993, 415). The remains of small
medieval structures built up against the north end of the Basilica Julia have yielded strata reflecting "attivita' di tipo artigianale", including an assemblage of despoiled metal ties (Maetzke, 1991, 84-5). The assumption that this, too, represents the traces of metal-working relating to the re-casting of scrap is tempting, but in the absence of any furnaces we cannot be sure; elsewhere, in fact, a similar assemblage of metal cramps has been taken to denote a workshop charged with restoring rather than despoiling the Forum's monuments (Giuliani & Verduchi, 1987, 163). The more disparate collection of metal objects - most of them broken - found in "medieval" buildings destroyed during the construction of the Piazza Vittorio quarter would be a better example of a possible scrap-metal merchant's workshop (NS 1888, 132; Bull. Comm. 1888, 76).

2.3 Stone

Unlike the materials considered up to now, tufa and marble have survived in great quantities in early medieval churches and fortifications in Rome. We can therefore concern ourselves here chiefly with a discussion of their source and supply as opposed to making a case for their use. Together with brick and mortar they served for the foundations and load-bearing walls of all monumental architecture; regarding even those domestic structures noted in the tenth-century Roman property documents (and from the seventh and eighth centuries in Ravenna), it seems that stairs and paved courtyards were commonly of marble, with the superstructure at least based around "pilae tiburtinae", or tufa piers (Hubert, 1990, 215ff).

2.3.1 Tufa

The question as to whether tufa was newly-quarried during the early middle ages in Rome remains unanswered. As with metals, there is no physical or textual evidence for quarrying, but much for the use of spolia. The only secure proof for continued quarrying
would be the discovery of datable material in a shaft or at a rock-face; in the absence of this we are reduced to supposition. The ready availability of tufa in Rome is well-known. Despite the emphasis given to those quarries and types of tufa located outside the city, there is a great variety of the stone occurring naturally almost everywhere within Rome itself; this was exploited throughout the Classical period far more than has been generally noted (Blake I, 39; DeLaine, 1992, 130). Such availability, together with the stone's ease of working, would have made continued quarrying into the middle ages a simple matter. However, our earliest reference to what may be quarrymen comes in an eleventh-century property document, and the first likely use of freshly-quarried tufa - identified as such due to the homogeneity of the small rectangular blocks, or tufelli - seems to have been in Honorius III's S. Lorenzo fuori le Mura around 1200 (Hubert, 1990, 224; Avagnina et al, 1976-7, 236). Prior to this date, the examples of tufelli found in medieval buildings show the same characteristics of re-use as do the bricks: they are of unequal size, of varying colour, often broken, and with rounded corners - all signs that they were removed from various earlier buildings (Heres, 1982, 30). In a few cases the blocks' very regularity of size, and their precise square shape, suggest that Roman walls of opus reticulatum were the spolia source (CBCR I, 311; III, 169).

When we find rising walls of spolia tufelli, they are used in conjunction with spolia brick in a technique now commonly known as opus vittatum - alternating courses of brick and tufa. Since tufa is an inferior building material to brick, being structurally weaker, less durable, less resistant to fire and damp, and generally less plastic to work with, we are faced with the question of why it was used at all. Various reasons have been suggested, from its low cost (Barclay-Lloyd, 1985, 243), to a shortage of brick (Apollonj-Ghetti et al, 1944-5, 228), to decorative taste (Pani-Ermini, 1987, 20). The last idea would seem impossible to prove at this stage (it is in fact possible that all walls were originally rendered with stucco or plaster). The first two seem reasonable, but inspire further questions: why, since we are dealing with materials which were all spolia anyway, would it have been more expensive to remove bricks from older buildings than tufa? And given the vast

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5 Still occasionally referred to as opus mixtum or opus listatum, or even opus vittatum-listatum.
number of Roman monuments whose brick facing survives up to today, how could there ever have been the remotest shortage of the material in the early middle ages?

A survey of dated monuments might clarify where and when the material was used; reasons for such use will then be proposed below in 2.7 (there will be a slight overlap here with brick, to be dealt with in detail in 2.5). Firstly, it should be stressed that the usage of materials in the early middle ages depended primarily on the availability of the same materials in the Roman monuments from which they were removed. In the suburbs these monuments had been more commonly constructed of locally-quarried tufa, which was nearer to hand than urban-produced brick (Blake III, 301; Lugli, 1957, 633). It is not therefore surprising that early medieval buildings outside the walls of the city utilised opus vittatum throughout our period - for there was less of the superior brick to begin with. Examples include, in chronological order (I give references only for the controversial dates): SS. Nereo & Achilleo at Domitilla (523-6 - CBCR III, 133), S. Lorenzo fuori le Mura (579-90), S. Agnese fuori le Mura (625-38), the crypt of S. Valentino (642-9), S. Andrea on the Via Labicana (687-701, see 4.1, #6, below), S. Passera (mid ninth century - Bertelli et al, 1976-7, 157-60) and various rebuilt portions of the Aqua Alexandriana (772-867 - Quilici, 1974, 55 & see 5.2.2, below).

The situation within the city was more complex, given the far greater source of Roman brick. The tufelli available as spolia here came from Roman monuments constructed of opus reticulatum, and those (mostly fourth and fifth-century) buildings which were themselves constructed of opus vittatum. At the beginning of our period it appears that brick was the preferred material, at least for those projects which can be reasonably well-dated: the restoration of the Aurelianic Walls by Theoderic (see 5.1.2), minor rebuilding at S. Pudenziana (536-7 - CBCR III, 300), pier-strengthening beneath S. Martino ai Monti (early sixth century - CBCR III, 105-7) and the SS. Apostoli (c.560s - Ferdinandi &

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6 These buildings were relying, at least during the fourth century, on newly-quarried tufa (Lugli, 1957, 637). Why the use of tufelli was re-introduced to Rome at this time (that is, after their ancient employment in opus reticulatum buildings) is a question which concerns the Classical period; it would presumably denote problems, or a change of practice, in the brick industry.
To complicate matters, some opus vittatum structures inside the city have also been assigned an early sixth-century date, on the grounds that their brick courses include one or two stamps of Theoderic: these are the fragmentary remains in the Largo Argentina and a blocked portico near the Theatre of Marcellus (Santangeli Valenzani, 1994; Colini, 1941, 391). If such dating is accepted, it would be fair to distinguish the latter, opus vittatum structures as buildings of far less prestige than the brick-built public works.

There are few surviving monuments from the seventh and early eighth centuries inside the walls, but the evidence we have suggests that during this period construction in pure brick gave way to opus vittatum: S. Venanzio, the east apse of S. Stefano Rotondo (640-2), the mid seventh-century phases at S. Saba (CBCR IV, 69), and the crypt at S. Crisogono (731-41 - CBCR I, 159). From the mid eighth century to the end of our period all rising walls were once again constructed of brick (from at least Zacharias' S. Gregorio Nazianzeno - see 4.1, #11; in general, see 2.5). Also from this time, we see the constant use of very large tufa blocks - a kind of re-used opus quadratum - for foundations, and even parts of rising walls (Bertelli et al, 1976-7, 126ff; tenth-century examples include the apse of S. Sebastiano al Palatino and additions to S. Maria Antiqua - 4.2.1, below; Osborne, 1987, 191).

It emerges then that the use of tufa in early medieval Rome was quite specific. In the form of opus vittatum it was employed within the walls between c.640 and 740, and perhaps earlier for small-scale works; outside the city opus vittatum was common throughout the period. In the form of opus quadratum, tufa was used from around the mid eighth century onwards. In all cases the material was spolia. The texts are generally quiet on the sources of this spolia, and on the material in general. We learn from the Liber Pontificalis that Hadrian I demolished a "huge monument of Tiburtine tufa" to make way

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7 The so-called amphitheatre in the Stadium of Domitian has sometimes been assigned to Theoderic, again on the basis of two brickstamps. It seems that part was built of brick spolia, with additions in opus vittatum; dating here is impossible, since the bulk of the structure has been destroyed (Ungaro, 1979, 107-8, who suggests a fourth-century date with sixth-century additions).
for his enlarged S. Maria in Cosmedin; it is almost certain that he then used this stone for
the church, since the building preserves a great amount of spolia Anio-tufa blocks in its
Hadrianic phase (LP XCVII, 72; CBCR II, 297-8). The biographer of Leo III makes
reference to the laying of "firm foundations" for three of the pope's buildings which
preserve traces of the same re-used tufa blocks within their foundations: S. Susanna
(XCVIII, 9; blocks studied by Bertelli et al, 1976-7, 141-2), the triconch triclinium at the
Lateran (ch.10; blocks excavated in Bull. Comm. 1913, 74) and S. Stefano degli Abissini
(ch.90; blocks in CBCR IV, 192). Krautheimer usually refers to these blocks as "Servian",
and the indications are that much of this post-eighth-century spoliation did in fact use the
Republican city wall as its source. Firstly, many of the churches in question are in close
proximity to the Servian circuit (S. Angelo in Pescheria, S. Saba, SS. Quattro Coronati, S.
Martino ai Monti, S. Prassede, S. Susanna and S. Silvestro in Capite). In many places the
Servian wall has been systematically dismantled, leaving absolutely no traces at all (as on
the Caelian - Colini, 1944, 32); we know, however, that it was still almost intact in some
places at the time of the late eighth-century Einsiedeln itineraries, that is, when the buil­
ders of these churches were seeking their materials (notably on the Esquiline, where routes
continued to use the Porta Viminalis and Porta Esquilina - Lanciani, 1890, 475). The
clearest evidence is Lanciani's claim that quarry-marks known from blocks in place in the
Servian walls were still visible on some of the re-used blocks in the foundations of S.
Martino ai Monti in 1890 (op. cit. 489).

2.3.2 Marble

Marble was used throughout the period in all types of building. It served for the
columns and architraves of trabeated colonnades, for the corbels of timber roofs, for
paving and wall-revetment in the form of both slabs and tesserae, and for a variety of
church furnishings such as choir screens, ciboria and altars. More-or-less rough fragments
were also mixed into the facings of rising walls and included as aggregate for concrete.
The only natural source of marble in Italy is at Carrara in the Apuan Alps. The Roman quarries here fell into disuse during the fourth century (B. Ward-Perkins et al, 1986, 142-3); any newly-quarried marble used in Rome during our period therefore had to be imported from overseas. There is substantial evidence for such traffic prior to the Gothic Wars, nearly all of it involving finished church furnishings from Constantinople. A constant, but small-scale, influx of material from the east throughout the fifth and early sixth centuries is attested by the presence of capitals in Ostia and Rome made of Thasian and Proconnesian marble (Herrman & Sodini, 1977; Guidobaldi et al, 1992, 256). During the brief pontificate of John II (533-5) there was a vast increase specifically in the supply of finely-worked Proconnesian material, best studied at S. Clemente. Here a large liturgical enclosure, now used as a schola cantorum in the upper church, preserves John's monogram and has been used to date and provenance the remains of many other furnishings at S. Peter's, S. Maria in Cosmedin, S. Stefano Rotondo, S. Cecilia, SS. Cosma & Damiano, S. Prisca and S. Maria in Via Lata. All examples are of Proconnesian marble of contemporary eastern workmanship; an architrave at S. Clemente even preserves a Byzantine factory mark (Guidobaldi et al, 1992, 130ff, 233, 257).

It would be tempting to see the various post-reconquest architectural sculpture whose craftsmanship appears similar to John's as continuing this supply pattern (notably the parapets of Narses' Ponte Salaria, known only from drawings - Russo, 1984, 22). However, at least one of these - a pilaster from SS. Apostoli - has been shown to be of (re-worked) Carrara marble (Guidobaldi et al, 1992, 263). The last, apparently solitary, example of eastern marble arriving in Rome is the exarch Eutychius' grant of six onyx columns for the shrine of S. Peter - if, indeed, they were from Greece, the source of Constantine's original set (LP XCI, 5; XXXIV, 16).^8^  

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^8^ The original date and provenance of the twisted columns is still far from clear. To the two sets of six at the shrine should be added two more columns, almost identical, set up by John VII in 705-7 at his oratory of S. Maria (Alpharani, 1914, 106). Eleven of the fourteen remain in new S. Peter's, two of which are the latter pair (op. cit. 55). J. Ward-Perkins identifies all the surviving columns as being of Greek marble, suggesting dates from the Flavians to c.300 for their original carving (1952, 24ff, 30). The building from which they came remains unidentified; there is no evidence that it was in the east. Indeed, there are only sixteen such columns known anywhere - and they are only known to have been utilised in Italy (the
It was in fact from spoliation that the bulk of architectural marble was provided in early medieval Rome. The laws against such practice in the Theodosian Code are well-known, and if marble is not specifically mentioned there is plenty of evidence that it was the need for this material which most often led to the spoliation and demolition of older monuments. Janvier has pointed out that the bulk of these laws were directed to the western provinces (1969, 353); this, and the fact that they proliferate from the time when the Italian quarries started to run down, would suggest that marble was a prime objective of the despoilers (especially as brick continued to be manufactured in Italy up to the Ostrogothic period). Where specific mention is made of the buildings favoured by thieves it is of tombs and temples - precisely those types richest in marble revetment (CTh IX, 17, 2; XV, 1, 36; Novellae of Valentinian 23, Majorian 4). Despite this, and perhaps because they were not state buildings, tombs continued to be selected by Rome's early medieval builders. The denuded tombs of the Via Appia, together with the epitaph-inscribed paving of so many of Rome's churches are ample evidence for this. Epitaphs and loculi slabs were ideally suited for such use. More specific cases include Domnus' paving of the Paradise at S. Peter's with travertine from the nearby Meta Romuli (p. 21, above) and the inscriptions from the Arvals' shrine, transported first to the cemetery of S. Valentino during the fifth or sixth century, and probably from there to Hadrian I's Galeria domusculta (Bull. Comm. 1889, 116; Christie, 1991, 301). Throughout the period we know of marble items - columns and tomb slabs - inscribed with warnings of anathema against potential thieves (Dattoli, 1920, 327; Gray, 1948, 143).

The petitions of Boniface IV and Honorius I to Phocas and Heraclius regarding the Pantheon and Temple of Venus and Rome would suggest that more respect was shown to public buildings. The fact that freshly-imported Roman supplies of marble were left untouched in the Marmorata up to the excavations of 1870 led Bruzza to surmise that the blocks' and columns' imperial stamps had continued to exercise sufficient warning to

fourteen from S. Peter's and two moved to Naples from an unknown location in around 1317 and destroyed in 1943 - J. Ward-Perkins, ibid.).
thieves (Gatti, 1936, 63); similar stocks remained intact at the ancient marble quay of the Campus Martius (Bull. Comm. 1906, 102). Other investigations at the Marmorata, however, unearthed evidence for small-scale re-working of column bases and capitals, and even the possible workshop of the spolia-craftsmen (Bull. Comm. 1891, 23-5; no more precise date was suggested for these than late Roman-early medieval). The legal rulings allowing public sources to be exploited for work on city defences might explain the apparent use of alabaster from the Marmorata to repair the Aurelianic Walls below Testaccio under either Honorius and Arcadius or Narses (CTh XV, 1, 36; Lanciani, 1899, 264 - I can find no evidence for his assertion, however) and the use of Julio-Claudian dedicatory inscriptions from the Temple of Mars for Honorius' and Arcadius' re-facing of the Porta Appia (Rose, 1990, 166).

In general, it is likely that standing remains provided ample spolia for all the architectural needs of the middle ages. Recent archaeological evidence has shown just how thorough the recovery of marble from private housing could be. Here it was chiefly decorative marbles that were sought - opus sectile, paving and revetment from walls and floors. In their survey of marble pavements in early medieval Rome, F. & A. Guidobaldi were able to study the remains of house floors only in isolated cases where they had been covered by a massive fall of debris. The evidence for pavements in the houses beneath S. Crisogono, S. Saba, S. Sabina and S. Stefano Rotondo survived only as imprints in the sand or rubble hardcore below, all traces of original marbles having been removed (1983, 518). Similarly-diligent salvage work had been carried out on the marble pavements of insulae on the Caelian some time after the fifth century (Pavolini, 1993, 55).

The use of marble in pavements changed over time. The late Roman predilection for opus sectile composed of large elements gave way during the sixth century to similar compositions using smaller marble pieces; over the next two hundred years the trend toward smaller elements in pavement design produced varieties of tessellated mosaic, often combined with panels of opus sectile, again composed of very small fragments (F. & A. Guidobaldi, 1983, 487). Only in the late eighth century was there a return to a true
opus sectile of larger marble pieces (op. cit.; McClendon, 1980). Strangely, these authors never posited changes in the supply of the actual marble spolia as a cause of the decorative variations. On the other hand, Osborne has remarked that the appearance in Rome, at the time of John VII, of a specific type of wall-painting which imitates decorative textiles may well denote a growing shortage of marble for wall revetment (Osborne, 1992, 349). It is also around this time - the turn of the eighth century - that the Liber Pontificalis tends to add "ac totam depinxit" to its descriptions of the building works of various popes (LXXXVIII, 2; XCII, 11 & 12; this could also represent anti-iconoclastic propaganda).

The same text’s emphasis on the apparently vast source of decorative marble available to Hadrian I and particularly Leo III strikes a great contrast. The former repaved the atrium of S. Paolo and the interior of S. Peter’s (with "different and better marble") and adorned all of his new works at the Lateran with the same material (XCVII, 47, 56, 57). Leo used marble paving and revetment at S. Susanna, S. Paolo, the oratory of S. Croce and each of his palace buildings, including the triconch triclinium at the Lateran: "he laid the floor with pictorial marble and decorated it with various porphyry and white columns, and with carvings, bases and lily-shaped ornamentation on the doorposts" (XCVIII, 9, 10, 27, 31, 35, 39, 66, 92, 97). Apart from the opus sectile from these pontificates, evidence for the great output of the sculpture workshops at this time comes from the innumerable marble plutei (liturgical screens) preserved in so many late eighth and ninth-century churches in the city. As we shall see in chapter 4, such decorative work continued throughout the tenth century.

The developments in the use of decorative marble, then, can be briefly summarised: an apparent move toward smaller components during the seventh century in conjunction with a growing reliance on fresco rather than wall-revetment, followed by a trend towards lavish marble displays in the late eighth century and after. It would be interesting to see if this pattern was reflected in the use of structural marble - columns, architraves and corbels. Certainly there was a trend towards somewhat smaller buildings during the seventh century, generally single-naved structures with no marble colonnades (see 4.1,
below and B. Ward-Perkins, 1984, 58-61). The problem here is that it is difficult to ascertain whether a lack of structural marble was the cause or effect of this decrease in building size. One solitary clue to the possible effects that a lack of marble spolia could have on a larger edifice is found at S. Giorgio in Velabro. The arguments for assigning the present nave to the late seventh century will be found in 4.1, #4, below. The colonnades here are the most heterogeneous and ill-matched assemblage of marble spolia in Rome, and include one column (the second in the left colonnade) which is actually formed from two disparate shafts.

The many surviving churches of the late eighth and early ninth century show that the largescale use of structural marble at this time easily matched that of the decorative variety. Few buildings preserve entirely homogeneous colonnades, but many utilise column shafts of the same varieties of marble or granite (Pensabene, 1989, 61). What we know of the many tenth-century churches in the city suggests that these were generally small, single-naved structures with no great display of columns or achitraves (see below, 4.2). Unlike the seventh century, however, there is no evidence here for a general lack of marble spolia; the churches' small size can be explained by the facts that most were independently-financed, and often served as monastery or family chapels.

A final, somewhat unexplored topic concerning marble spolia is the use and typology of corbels and soffits. Most commonly used to support the rafters above apse vaults, their only substantial in-situ survival in our period is in the sequence of churches of the so-called Carolingian Renaissance. In the apses of SS. Nereo & Achilleo, S. Cecilia, S. Prassede, S. Giorgio in Velabro, SS. Quattro Coronati and S. Martino ai Monti are preserved a characteristically florid corbel, decorated on the underside with a broad acanthus leaf. In the first and last of these, the corbels are incorporated with matching soffit-slabs, carved with grotesque bearded faces. Examples of the same slabs are also preserved inside S. Prassede and SS. Quattro Coronati. Scholars disagree as to whether all, some, or none of these are Classical in origin; the heterogeneous carving of different faces even on the same slabs at S. Prassede would suggest that these at least represent
ninth-century copies of an ancient original (Zito, 1967, 79ff). Which buildings served as the source, or model, for such elements is hard to say. The corbels were in use in Rome from the time of the Flavians (the entablature of the Forum of Nerva) to the Tetrarchy (the Baths of Diocletian - Egger, 1925, taf. IV). The soffits seem rarer. The bearded face motif, originally from the east, is relatively common in cornice decoration (the Arches of Septimius Severus and the Silversmiths - Zito op. cit. 79). The only example I know of such a face on a Classical soffit in Rome is in a Heemskerk drawing of the Temple of Serapis (Lanciani, 1989-92 III, 222). It is quite likely, however, that such soffits were also used at both the Baths of Caracalla and the Temple of the Sun, where we have evidence for the motif on cornices (Zorzi, 1959, fig.119; NS 1908, 231). Considering the proximity of SS. Nereo & Achilleo to the former, it is extremely likely that the Baths furnished that church's corbels and soffits. Also, bearing in mind that the examples from the Temple of the Sun were discovered beneath the apse of the rebuilt S. Silvestro in Capite, it is not impossible that Paul I's original church was in fact the first to re-use such spolia in its own apse.

2.4 Mortar and Concrete

Mortar, like timber, was a constantly-needed material which could not be provided simply by the spoliation of buildings. Unlike timber, its components - lime and pozzolana sand - could be found both readily and plentifully within the city.

Lime was produced by burning and slaking limestone, marble and travertine. Once the spoliation of older monuments for building materials became common, around the time of Constantine, the supply of lime must have grown to rely upon this same source. Palladius (late fifth century) may be the first authority to condone the practice when he adds marble to the other Vitruvian sources of lime; it had earlier been outlawed in a law of 349 AD (Pall. I, 10, 3; CTh IX, 17, 2). The well-known references in the Theodosian Code to
the 3000 carts of lime to be supplied annually to Rome from Campania, Samnium, Pican-
um and Tuscia-Umbria date from the later fourth century (XIV, 6, 1-4). These loads
were presumably not spolia, but freshly-quarried limestone and travertine, to be burnt for
lime at the Schola Calcariensium near the Baths of Diocletian (Collon, 1940, 89). How
long such organisation continued is hard to say. The "cespes formensis", estates which
supplied slaked lime for the maintenance of the aqueducts (see chapter 1, n.1) are still
referred to in Flavius Valila's donation of 470 AD (p. 27, above; these must have provided
the material for works carried out on their land, outside the city). The formula for Theo-
deric's Praepositus Calcis, however, makes no reference to any fresh consignments of lime
from the suburbs (Var. VII, 17). Considering that this was an entirely new post, and also
that only the burning and distribution of lime is alluded to, it is possible that this marks a
change to an officially-organised supply based upon local spolia. In the early eighth
century the Liber Pontificalis makes three references to papal supervision of the lime
supply, all due to restoration campaigns on the city walls: Sisinnius and Gregory II
"ordered the burning of lime", and Gregory III paid for its purchase (LXXIX, 2; XCI, 2;
XCII, 15). Because Hadrian I requisitioned labour from "all the cities of Tuscia and
Campania" in his own restoration of the walls, it has been suggested that here the Theodo-
sian tradition of Rome's lime supply was being continued (XCVII, 92; Gibson & Ward-
Perkins, 1979, 32, n.6).

There is much evidence for lime-burning from spolia within the city, both directly,
in the form of kilns, and indirectly in the accumulation of heterogeneous marble and
travertertine material inside ruined buildings. The dating of both kilns and stocks, how-
ever, is seldom precise. As might be expected, kilns were situated in as close proximity as
possible to their source of marble, two particularly rich areas being the Forum and the
Largo Argentina. The late nineteenth-century excavations of the Atrium Vestae found
some of the smaller rooms of the complex turned into large lime-kilns, one still filled to
two thirds of its height with statue bases whose interstices were packed out with smaller
marble pieces; two deposits of quicklime and charcoal were also found. The date of these
must have been after the early sixth-century restorations, perhaps some time in the seventh
century when the vaulting of much of the complex collapsed (NS 1883, 485ff). A lime-kiln found in the Temple of Venus and Rome with walls of porphyry columns must post-date the first spoliation of the building by Honorius I; it was perhaps contemporary with the construction of S. Maria Nova, which used marble fragments from the temple and was built on its podium after the earthquake of 847 (Nibby, 1839, 730). The early medieval workshops of the Basilica Julia showed evidence of lime-burning and marble-hoarding (Maetzke, 1991, 84). Finally, a photograph of a kiln excavated and destroyed by Boni in the Horrea Agrippiana shows that it was constructed in the characteristic manner of the ninth century (Astolfi et al, 1978, 83-4).

More carefully investigated is the Largo Argentina area, known since at least 1024 AD as the "calcario" (Sagui, 1986, 354). Situated at the centre of a district bounded by the Baths of Agrippa to the north, the Theatre of Pompey to the west, the Saepta to the east and the Theatre of Balbus to the south, the medieval lime-burners' quarter was well-placed for materials (Marchetti-Longhi, 1972, 6). The most detailed archaeological investigation of an individual kiln is of that of the ninth century situated in the exedra of the Crypta Balbi. The excavators pointed out the kiln's typological similarity to Roman exemplars: a lower cylindrical space, dug 3m into the ground and faced in spolia brick, served as the combustion chamber; the travertine and marble, all taken from the surrounding complex, was placed in a wider chamber directly above this. A deposit of quicklime was found laid to one side on a base of bricks, the latter formed as a shallow basin for the slaking process (Sagui op. cit.).

Sand was the other ingredient of lime mortar, and the local volcanic variety now known as pozzolana continued to be used throughout the middle ages, as it had been during the Empire. Surveys of church-wallings of all dates have found the mortar to be pozzolanic, and therefore quarrying of pozzolana must have continued - although there is no archaeological evidence for this. Quarries usually identified as Roman proliferate in the southern suburbs of the city, but pozzolanas are abundant elsewhere - inside the city near Porta Nomentana, and on the Capitoline (Blake I, 43-4; NS 1892, 265). Tunnels dug
beneath the Baths of Diocletian to exploit this source were perhaps responsible for the ultimate collapse of the buildings - although any more precise dating for such quarrying is lacking (Canevari, 1874-5, 433-4). In various tenth-century property concessions there are references to suburban estates which possess "criptis arenariis" - almost certainly pozzolana galleries; their inclusion within such documents would suggest that they were seen as of economic benefit to the owner, and as such may be taken as notices of medieval pozzolana mining (PL CXXXIII, 919ff, which refers to estates on the Via Salaria and Via Latina; more references in M. De Rossi, 1864-77, who, intending to demonstrate that such expressions usually mean catacombs, actually gives firmer evidence for the mining interpretation).

The medieval terminology for another pozzolanic material, opus signinum, is also worthy of note. In Classical texts the phrase means a water-proof plaster made from lime and pounded potsherds, recommended for surfaces which come into regular contact with water, such as aqueduct channels, sewers and the vaults of bath-houses (Blake I, 323). In Rome it is last attested archaeologically in Honorius' raising of the Aurelianic Walls, where traces survive on the extrados of the concrete vault of tower 3 in the northern stretch of Trastevere (Cozza, 1986, 115). However, Cassiodorus continues to use the term in its antique context whilst describing both the sewers of Rome and an aqueduct in Ravenna (Var. III, 30; V, 38). The term then disappears from the texts until the early ninth century, when it is used by the Liber Pontificalis biographer of Leo III. We have already seen this writer showing an interest in foundations, colonnades and varieties of decorative marble, and so it is perhaps consistent that it is here that we have our first reference to opus signinum for three hundred years. The context, however, is somewhat strange. We are told that the new-built oratory of the Holy Archangel at the Lateran was "in segnino opere firmissime construens" (XCVIII, 92). The oratory no longer survives, but it is shown in Da Rasponi's plan of the old Lateran, enabling us to identify it with an illustration in Fra Santi which shows a tiny, square structure, similar to the S. Zeno chapel at S. Prassede,

9 The first reference to pozzolana as such comes in a document of 1285 ("puteolane" - Hubert, 1990, 227). Vitruvius used the term "pulvis puteolanus" only for pozzolana from Puteoli; the Roman variety he called "harena fossicia" (II, 6, 1; 4, 1).
but free-standing (plan in Verzone, 1976, fig. 47; Santi, 1595, 2). We might therefore imagine a cross-vaulted building with an opus signinum-lined cupola, like the Honorian towers of the city walls. Given the more sweeping nature of the brief description, however, and the fact that it would be most unusual for both the term and the use of opus signinum to re-appear in their original Vitruvian sense after such a long caesura, another solution should be sought.

It is possible that our writer was using the term to describe the form of the structure rather than the ancient material. Leo's pontificate is notable for a number of vaulted structures: the rebuilt S. Croce oratory and eastern mausoleum at S. Peter's (S. Andrea), a new round bath at the Vatican, and the eleven-apse triclinium at the Lateran, all involving the new construction of domes and semi-domes on a scale not known in Rome for hundreds of years. In the tenth-century property documents, the expressions "crypta in integrum sinino opere constructa" and "crypta sinino cooperta" are used constantly to signify ancient vaulted substructures, adapted for private use (see chapter 6). The technical term by this stage has unquestionably been transferred from the material once used for vaulting to the vaults themselves (Hubert, 1990, 203).

There is a virtual silence on concrete itself during the early middle ages - but this should not be taken to mean that the material fell out of use. Even in texts of the early Empire the terminology is somewhat vague, with "structura" meaning both concrete and ashlar construction (Plommer, 1973, 18). "Caementum" is used by Vitruvius for the aggregate of concrete, and since Agnellus uses the word in a description of sixth-century works in Ravenna this would constitute an early medieval textual reference to concrete itself (II, 8; LPR 73). And in fact, because "structura" and "caementarios" both came to be used as general terms for "structure" and "wall-builders" respectively, we might conclude that walls were normally built of concrete long after the Roman period. Despite this, and

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10 I make no subjective distinction between "mortared rubble" and "concrete" here, and use this definition for the material: "a composite material composed of coarse granular material (the aggregate or filler) embedded in a hard matrix of material (the cement or binder) that fills the space between the aggregate particles and glues them together" (Mindess & Young, 1981, 1).
usually with no good evidence, most studies of late Roman and medieval architecture either make the assumption that the use of concrete died out at some indeterminate time after the Empire, or else ignore the material altogether (MacDonald, 1958, 2; Conant, 1959, 59; Mainstone, 1988, 174).

In fact, in early medieval Rome - and probably in every other urban centre around the Mediterranean - all monumental architecture continued to make use of faced concrete walls. Where surveys of standing buildings have had the opportunity to examine the internal part of such walls, they are invariably of a mixture of pozzolana mortar and rubble: the seventh-century phases at S. Saba, the early eighth-century walls of S. Crisogono, the ninth-century Leonine Walls, and various ninth-century phases of the Aurelianic Walls (CBCR IV, 61; Gibson & Ward-Perkins, 1979, 55; 5.1.2, below). However, where early medieval concrete walling can be observed in cross-section, as at the eighth-century phases of S. Crisogono, it does appear that the rigorous Imperial method of laying a concrete of homogeneous, coursed aggregate, bonded to the curtain-walls by the sharp points of the brick facing, had given way to a far more careless system. Here, the aggregate is of different materials, variously-sized, and laid in disorder; the rough spolia brick and tufa of the facing does not effect a good bond with the core. Despite this, the early medieval variety of concrete proved perfectly adequate for the structures of the time. This was presumably due to the great strength of the pozzolana material, but the fact that trabeated buildings, unlike the vaulted monuments of the Empire, exert no great outward thrusts must have enabled the early medieval builders to get away with a much rougher concrete than had their predecessors. Lastly, it should be added that all examples of (admittedly smallscale) vaulting in the period - that is, apses, crypts and occasionally cross and barrel vaults - must certainly have been constructed of concrete (see for example Munoz' examination of the S. Barbara chapel at SS. Quattro Coronati - 1914, 33).
2.5 Brick and Tile

Of the materials so far considered we have found that timber and pozzolana were supplied as new, whereas for the most part metal, stone and quicklime were obtained by despoiling older buildings. The situation with brick and tile is less clearcut. Certainly there is evidence for the use of both new and old material, but in what proportion it is still difficult to ascertain. Our evidence, with a few exceptions, comes entirely from archaeology; and the fact that most texts after Cassiodorus ignore this subject altogether suggests in itself that, in Rome at least, the supply of brick and tile was not a problem.

Both archaeological and historical sources concur on the revitalised tile production in Rome under Theoderic. Var. I, 25, from 507-12 AD, is addressed to a certain Sabinianus and charges him with organising an annual supply of 25000 tiles from the Portus Licini brick depot, recently repaired with central funds, for the restoration of the city's public buildings. The letter states that associated depots have illicitly passed into private hands; this, and the fact that still more actual factories (figlinae) were officially conceded to the private sector in Var. II, 23, suggests that there was a vigorous private production of the material around this time. Sabinianus' 25000 tiles probably represent a payment-in-kind tax from this particular private company to the state; they do not amount to a large proportion of the total annual production capacity (considering that the output of a single worker was c.220 tiles per day - Della Valle, 1959, 141-2). Regarding the official consignment, Cassiodorus suggests that they are intended solely to repair the roofing of older monuments ("tegularium tegmine custoditas", Var. I, 25).

Surprisingly, despite the sizeable literature on the brickstamps of Theoderic, no one has suggested that they were executed simply to distinguish the official state consignments of these private brick-makers. There is a great deal of archaeological evidence

11 See Bloch (1959) and Steinby (1986). Righini puzzles over the anomalous nature of Theoderic's
that this state-sponsored policy of brick-production was successful: it almost seems that every excavation or restoration in Rome over the last hundred years has discovered a stamped tile of Theoderic or his successor Athalaric; some Roman stamps have been found as far afield as Milan (Fiorilla, 1986, 337-9). Whether found in walls or in situ on roofs, it is generally tegulae and imbreces that are attested (many catalogued in Steinby, 1986, 114ff; see below, 5.1.2, for examples from the Aurelianic Walls). Such finds, of course, serve chiefly as a terminus-post-quem for specific building phases; however, where sizeable numbers appear within structures otherwise known to have been worked on under Theoderic, we can accept them as evidence for original early sixth-century campaigns (Steinby op. cit. 139ff12).

Several other stamps, similar iconographically to those of Theoderic and Athalaric, have been found bearing individuals' names, perhaps the private "domini" (quarry-owners) or "officinatores" (kiln-owners) referred to in the Variae: they include Boniface (or Beronianus), Symmachus, Claudius, Benignus and Sabinianus (Steinby op. cit. 116, 153; Bull. Comm. 1897, 309; CIL XV.1, 1555 & 1576). The latter could well be the kiln-owner of Var. I, 25: both of his stamps were found at the same sites as stamps of Theoderic. In addition, a great variety of patterned stamps are known, many featuring Christian symbols; their date is not precise, but some have been found in conjunction with stamps of Theoderic (as in a stretch of the Aurelianic Walls near the Lateran - Pfeiffer et al, 1905, 2, 7). The fact that in all periods of Roman brick-production much of the material was never stamped would imply that a majority of the output of the private figilinae during the

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12 Substantial restorations and new works undertaken at this time using Theoderic or Athalaric tiles would therefore include: (secular buildings) the Basilica Emilia, the Curia, the Colosseum, the Baths of Caracalla and the Aurelianic Walls; (churches) S. Peter's, S. Paolo fuori le Mura, S. Maria Maggiore, S. Martino ai Monti (of Symmachus) and S. Giovanni a Porta Latina. Possible domestic building works associated with such stamps are mentioned in chapter 6.
The Liber Pontificalis never mentions papal brick production, but there have been various finds of stamped tiles and fragments of bricks or tiles which testify to such work. Our first example is a stamp bearing the words "Iohannes fec(it)", found when the right aisle of S. Susanna was demolished in 1938 (Bloch, 1947, 120). Most commentators assign this to pope John I, albeit with no explanation. Such an assignation would place its manufacture in the general context of early sixth-century brick-production; we also know from the lead aqueduct pipe (2.2, above) that John recorded new-made building materials in such a way. No restorations of S. Susanna are known by a pope John, but it could of course have been re-used at any time after its manufacture. The other (more certain) stamped papal tiles are of John VII and Hadrian I. Two examples of the former, bearing the inscription "+ Iwann", were found during excavations of the Atrium Vestae, and were assigned to John VII due to the Liber Pontificalis reference to his work at S. Maria Antiqua and its nearby episcopium (BICA 1884, 6; NS 1883, 494). The identification is further borne out by the palaeographical similarity to John's inscription on the same church's marble ambo, whose donation is in turn attested by the Liber Pontificalis (MEC XII, 4-6; LP LXXXVIII, 2). Hadrian's monogram has been found on tiles in situ on the roofs of S. Maria Maggiore (3 examples), S. Martino ai Monti and S. Paolo fuori le Mura (Crostarosa, 1896, 63; 1897, 238). The Liber Pontificalis records his work on the roof of each church (XCVII, 64, 67 & 74).

The great mystery of these papal stamps is how much new production of brick and tile they represent. It is most unlikely that the eight examples found constitute all those

13 A related question of brick production in Rome at this time which has received very little study is the manufacture of clay tubes for vaulting. They are known to have been used for various structures in the city from around 460 to 530: Hilarius' Lateran oratories, S. Agata dei Goti, S. Stefano Rotondo and SS. Cosma & Damiano (Colini, 1944, 369; Pellicioni, 1973, 107, CBCR I, 8 & fig.4; Brandenburg, 1992; Biasiotti & Whitehead, 1925, 93). Considering that they are unknown in earlier periods of architecture in the city, they must have been new-made, presumably in the same officinae-filiginae discussed here.

14 Apart from the Ostrogothic stamps, we know of tiles stamped by John's near-contemporary Maximian of Ravenna, which had been manufactured for an unknown building later taken over by the military (LPR 77).
originally stamped. And imagining that there must have been some upward ratio of stamped to unstamped tiles, we should consider them as an unknown fraction of the total number produced. Because so much Roman brick survives to this day, in place in Roman monuments, we know that there could never have been a physical shortage of Roman brick for spoliation in the early middle ages. Why then did these popes produce new-made material? Several possibilities come to mind. Political motives may have come into play: the stamping of new materials placed the papacy on a par with past civil rulers; this, of course, would explain only the actual stamping, not the production itself. Controls on the supply of the huge source of spolia will be considered in detail in 2.7, below; suffice here to say that the apparent reactivation, even on a small scale, of brick or tile production under John VII may be placed in the context of the contemporary decline in the use of marble and brick spolia highlighted in 2.3, above. What will be considered here is the demand for tiles as opposed to bricks.

We saw in 2.1 that decaying roofing was responsible for the greatest number of structural interventions on early medieval churches. Tiles, like timber, would therefore have been of paramount importance. Whilst Roman bricks survive in their original structures' walls, no tiles do on their original roofs; this fact is enough to demonstrate that the amount of available tile for spoliation would have been exhausted before that of brick (unless we assume that, miraculously, the vanished Roman roofs provided the precise number of roof-tiles needed for all early medieval structures). More evidence for the importance of tile as opposed to brick comes in the Ravenna property documents, which take the trouble to specify those rare cases of roofing in tegulae and imbreces (Brev. 64 & 71). In eleventh-century Rome a bishop exchanged an entire house for a piece of land and 100 tiles (Hubert, 1990, 228). A despoiled fifth-century insula in Naples was found by its excavators to have had all of its tiles removed, but much brick left (Paul Arthur, pc). Finally, the surviving new-made material suggests that, overwhelmingly, it was tiles as opposed to bricks that were produced during our period: most of the stamps of Theoderic

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15 In such a light, Pain's remarks on the significance of the tabula ansata are important, considering that John VII's stamp uses just such a motif (1986; he makes no reference to this early eighth-century manifestation, however).
and Athalaric are said to be on tegulae and imbreces, and our only papal examples are all from tegulae. On the other hand, the earliest traces of substantial new brick production come in the later middle ages, when for the first time church walls show use of homogeneous brick (Avagnina et al, 1976-7, 194 & 214).

Regarding the actual supply of brick as opposed to tile, we have already seen that surveys of early medieval structures show that spolia was wholly relied upon (p. 47, above). The walls are composed of heterogeneous elements: broken tiles, some with flanges facing outwards, and whole and broken bricks of varying colour and size - both bipedales and bessales. As seen in 2.3.1, there is a complete absence of surviving monuments which use only brick between c.640 and 740. From S. Gregorio Nazianzeno, however, and most notably from Leo III's pontificate onwards, the churches of Rome display whole walls of spolia brick. Whereas the material itself is particularly good, with mostly whole bricks used and a preponderance of sesquipedales and even bipedales, the workmanship is very rough. Courses tend to undulate and run into one another, and the walls themselves are often out of plumb (Bertelli et al, 1976-7). The precise monuments used for such spoliation are unknown, although many standing Roman ruins show vast stretches of walling whose brick facing has been quite carefully and thoroughly removed (for example, the northeast precinct wall of the Baths of Caracalla and much of the Horti Sallustiani).

The whereabouts of both Roman and medieval tile and brick production centres remain controversial, as do those of warehouses such as the Portus Licini. The former at least would presumably have been in as close proximity as possible to the clay deposits.

16 When fragments of stamped Ostrogothic material are described, it is hard to be sure that the words "tegula" and "mattone" are not being used indiscriminately. In fact I know of only three cases where the latter is used (Bull. Comm. 1900, 284; 1907, 340; 1917, 234). Most stamps are known from whole tegulae, found in situ on church roofs (notably, the five from S. Giovanni a Porta Latina and those from old S. Peter's - Krautheimer, 1936, 486; Grimaldi, 1972, 135). All those stamps from Milan are on tegulae, as were the papal stamps from Ravenna (Fiorilla, 1986; LPR 77).

17 Some commentators have interpreted "propter Romanae moenia civitatis" of Var. I, 25 as a location of the Portus Licini - that it was near the city walls, and, bearing in mind the Horti Lyciniani, perhaps near Porta Tiburtina (Bull. Comm. 1878, 43; Della Valle, 1959, 138).
of the valleys of the Tiber and its tributaries. Recent works have emphasised the importance of locations along the Anio and Farfa valleys, pointing to those Imperial brickstamps which actually specify a location there (DeLaine, 1992, 177-8); early Christian texts refer to a "civitas figlina" on the Via Salaria near the Jordani Cemetery, perhaps an industrial settlement for the production of bricks (Bull. Comm. 1892, 92). In some cases there even seems to be a concordance between the names of specific officinae and early medieval monastery properties in the areas, although this need not mean that brick production continued there (Steinby, 1986, 154). Crostarosa, in fact, has argued most persuasively for the Valle dell'Inferno, between the Janiculum and Monte Mario (1897, 205ff). He points out that although many of the imperial stamps which actually state their officina-location do admittedly name the Anio valley, these are just a tiny minority of the total number of stamps. The vast majority mentions no location; he therefore imagines the chief, unidentified centre to have been elsewhere, and produces Classical literary evidence for the Vatican area (op. cit. 210-16). Hubert gives a document of 1166 where a vendor apparently retains rights of clay-extraction for brick-making from the plot, in the Leonine City (1990, 224). The Valle dell'Inferno was still the principal site of modern manufacture at the turn of the century: a ruined brick kiln, last used for the great urbanisation projects of the late nineteenth century, survives today in Via A. Emo. Lanciani believed the entire valley to be a man-made landscape feature, created entirely by the exploitation of Roman times (Bull. Comm. 1892, 288).

2.6 Other Materials

Selce, or basalt, the black volcanic stone used in the Roman period chiefly to pave the streets, does not appear anywhere in well-dated early medieval buildings. It was probably used as a source for quicklime, as Vitruvius had recommended (II, 5, 1): lime-kilns found in the Palace of Tiberius contained selce statuary (Lanciani, 1899, 196). In selce-rich suburban areas it may have served as a source of spolia for rural buildings, as at
the late eighth or ninth-century buttressing of the Aqua Alexandriana at Pantano (p. 181, below). But its widespread use both as a facing material and as a decorative component of church pavements appears only in the later middle ages (as at the Castro Tuscolano on the Via Appia and numerous late restorations of the Aurelianic Walls - Cozza, 1993, 102).

Ninth-century references to "métallo gypsino" have caused some confusion. As might be expected, this material is first mentioned by the biographer of Leo III, with reference to the pope's work on the windows of S. Paolo fuori le Mura, S. Peter's and S. Giovanni in Laterano (XCVIII, 31, 34, 82). The difficulty here is that gypsum was used in this period for both window-panes and window-frames. It occurs naturally as a pale, lustrous granular material similar to alabaster, also known as selenite, and has been found cut into panes and inserted in window frames at S. Agnese fuori le Mura and S. Prassede (Frutaz, 1976, 51 & 153; Gandolfo, 1976, 313). The latter should date from the time of Paschal I, the former of either Honorius I, or the restoration of Hadrian I (LP XCVII, 85); both must surely be the material alluded to in the Leo III biography as an alternative to glass. Munoz believed that it was probably obtained from natural deposits in Tuscany or Romagna (1918, 125).

Windows from churches worked on around the time of Leo III - S. Agnese, S. Prassede, S. Giorgio in Velabro, S. Sabina and even S. Paolo fuori le Mura, specifically mentioned above - preserve transennae of a type of plaster also made from gypsum, in this case calcined gypsum (Gandolfo, 1976, 312ff; Frutaz ibid.; CBCR V, 144). Where Agnellus makes reference to wall decoration of "gipseius metallis" he presumably has the same material in mind, but obviously used in a different medium (LPR 23, 41, 86; cf. Isidore's use of the word gypsum to mean decorative relief work - Etym. XIX, 15). It can be regarded as a variety of stucco, normally made from slaked quicklime and powdered marble. Whether made from a base of gypsum or limestone, stucco seems to have had a continuous decorative function throughout our period. It is found forming cornices,

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18 No actual window-glass survives from Rome, although there are traces of the manufacture of glass vessels and mosaic tesserae at the Crypta Balbi (Sagui, 1993). At S. Cornelia on the Capractorum domus-culta glass vessels were re-worked to form window-panes (Christie, 1991, 82).
ceiling bosses, and applied to colonnade arches in churches from the fifth to the eleventh centuries (Gandolfo, 1976, 301ff). Elsewhere it formed the bedding for both frescoes and mosaics (studied at John VII's oratory of S. Maria and Gregory III's S. Crisogono - Nordhagen, 1965, 145 & Melogrami, 1991, 145). It is still unclear whether stucco, or a rougher plaster, was applied as a weathering finish to the exterior walls of buildings; the continued use of indented pointing, which would serve as a purchase for such a finish, might suggest that it was (Venanzi, 1943).

2.7 The Supply of Spolia

We have now seen that the bulk of building materials in early medieval Rome, with the exceptions of timber and pozzolana, were provided by despoiling either standing or ruined older monuments. It has been noted that, considering the amount of marble, tuffa and brick which survive in Roman monuments even today - that is, after the vast degradations of the Renaissance and Baroque periods - it is hard to imagine that there could have been the remotest lack of such materials during the early middle ages. And yet the surviving monuments of the years from the mid seventh to the mid eighth centuries show a declining use of both structural and decorative marble, together with a growing reliance upon opus vittatum at the expense of superior brick. Conversely, from around 800, the great new building programmes of Leo III and his successors were able to exploit a vast supply of marble columns, paving, corbels, capitals and decorative material, as well as greatly increased amounts of spolia brick, (presumably) spolia tile, and massive squared tuffa blocks. How should we account for such variations in the supply of materials?

The source of these materials was older buildings, among which tombs and public monuments were protected by Roman law. After 554, spoliation, occupation and even reconstruction of the latter in particular were forbidden without the express permission of the Byzantine emperor (the more relaxed attitude of the Ostrogothic regime to this
question has been considered in 1.3, above). At no time up to and during the seventh century - our period of declining quantities of spolia - do we hear of the papacy acting illegally in this respect. If, as it seems, the papacy was not disposed to despoil public monuments without permission, it would have had as its chief sources of building materials the following: any buildings, ruins or materials on its own property; abandoned public buildings affected by the "forty-year rule" (see 1.2, above, for both of these); any new-made or quarried supplies such as John II's imported marble and the tiles considered above; and, finally, any materials which could be bought. These latter, attested by the various references from Gregory I's letters and the Liber Pontificalis already considered, would themselves have been obtained from the other categories listed, and would quite likely have included the stolen material considered above (notably metal and marble, but almost certainly brick and tile as well).

Such a category of building materials presupposes the existence of what we might call "spolia middlemen", that is, the merchants who sold the materials (also referred to in a 544 law of Justinian which sought to limit the prices they charged - CICN CXXII). Their status would probably have been analogous to the relic-sellers of the ninth century, usually working in concert with unscrupulous guardians of the relevant sites (Guiraud, 1892; cf. also Desiderius of Monte Cassino's attempts to obtain marbles from Rome in 1060 through the efforts of "very good friends" and the payment of "handfuls of money" - Kinney, 1986, 389). Considering that the sources listed above had been exploited steadily since the time of Constantine it is not surprising that, as time went on, and specifically by the mid seventh century, such supplies were running low. In the light of such scarcity, we can legitimately start to speak of the "rarity" of superior brick to tufa, and hence of the spolia-sellers perhaps raising the price of the former commodity (as 2.3.1, above).

The papacy's assumption of complete control over Rome's ancient monuments predates the fall of the Exarchate, and should be put in the context of its growing independence in the economic and, above all, political spheres (Noble, 1984). Against a background of tax-boycotts on the part of the papacy, assassination attempts against the pope
by the Byzantine authorities, the minting of a purely-papal coinage, and the political, military and economic leadership offered by the papacy to the Duchy of Rome, the demolition of abandoned Roman monuments would seem an almost insignificant evasion of the law. The first tentative examples of papally-conceded demolition would appear to be those of the Republican temple on the site of S. Gregorio Nazianzeno, and the Porticus Octaviae (for S. Angelo in Pescheria), in the period 741-51 and 755 respectively (see 4.1, #11 & #12, below). We have noted the increased use of decorative marble from the end of the eighth century; but, to judge from the Liber Pontificalis, the material began to make a reappearance during the pontificates of Zachary and Paul I: for the first time the text adds "diversis marmorum...ornavit" to descriptions of building works (at the Lateran Palace and S. Silvestro in Capite - XCIII, 18; XCV, 5). Paul's S. Silvestro, as we have seen, may have been the first new building to re-use Imperial sculptural decoration in the form of mask-soffits for its apse; and its construction must have involved the demolition of the remains of the Temple of the Sun (CBCR IV, 152).

The exploitation of the vast new source of building materials represented by Rome's up-to-then well-preserved ancient monuments gained pace during the succeeding pontificates. We have seen even the Liber Pontificalis referring specifically to the demolition of such structures under Hadrian I (the tufa monument overhanging S. Maria in Cosmedin, perhaps Pompey's Temple of Hercules - LP ed. Davis, 159 n. 142; we also hear of the destruction of the Temple of Concord during works to repair SS. Sergius & Bacchus - XCVII, 90), the materials of which were re-used for the new building work. The Baths of Caracalla were despoiled for Leo III's SS. Nereo & Achilleo: apart from the corbels and soffits, discussed above, a number of porphyry bases were re-used inside the church (CBCR III, 141; Lanciani, 1897, 537); and the church's fine spolia brick was almost certainly removed from the denuded precinct wall of the Baths\(^\text{19}\). In a similar manner, the Temple of Venus and Rome served as a quarry for Leo IV's S. Maria Nova

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19 Eight capitals from the libraries of the Baths of Caracalla were removed to S. Maria in Trastevere (Kinney, 1986). This spoliation need not have occurred as late as the twelfth century (when Innocent II rebuilt the church); considering that the Baths were first exploited by Leo III, a better date for the S. Maria spoliation would be during the reconstruction of Gregory IV (827-44; LP CIII, 31-3).
and the Servian Wall for the foundations of many churches (2.4 & 2.3.1, above). Also by
the time of Hadrian I, there was enough marble spolia in Rome for supplies to be exported
to Charlemagne's palace at Aachen (Einhard 26).

The changes in the supply of spolia, as well as the reasons for these, have now
been explained. We should finally consider briefly the physical process of collecting such
supplies. It is often postulated that stocks or storehouses of spolia existed, centralised
depots of specific materials. This would seem likely in the case of decorative marbles for
pavements. These were small, easily transportable elements, and the very make-up of
medieval pavements would necessitate having all the materials to hand before work
commenced; often, it seems, opus sectile flooring was pre-fabricated in workshops before
being transported to the site (F. & A. Guidobaldi, 1983, 175ff). The collection of smaller
elements such as tiles and metal by our "spolia middlemen", or thieves, would also call for
the existence of storehouses: the sporadic theft of whole tiles and loculi slabs from individ­
ual catacombs, for example, would have been inadequate to supply a single, new building;
such thefts would only make sense if the materials were stored up until a sizeable amount
had been obtained (cf. examples in Ferrua, 1991, 38-40). The only archaeological evidence
for such stores, however, would appear to be the scrap-metal deposit referred to in 2.2.

Guidobaldi has also proposed the existence of storehouses for larger marble
pieces: noting the perfect preservation of the re-worked capitals on Mercurius' ciborium at
S. Clemente, he concluded that they must have been kept safely in storage between their
original manufacture and their re-use (1992, 38). This might also explain how eight of the
spiral columns of S. Peter's had been kept so safely for the four hundred years between
Constantine's donation of the original set and John VII's and Gregory III's work (see note
8, above). In both of these cases, however, it is possible that the pieces had been preserved
in situ in their original buildings prior to their spoliation and re-use. The looting of ancient
storehouses is another possibility. We have mentioned the stocks at the Marmorata in
2.3.2, above; regarding Roman tile depots, Crostarosa believed that these had been utilised
for the original roofing of S. Maria Maggiore, since the 14000 tiles needed for the project
would have proved exceptionally difficult to produce from a random search, and the bulk of the remaining brickstamps were of the second century (1896, 88; for similar reasons, 600 Severan stamped tiles from the cemetery of S. Tecla were believed to have come from a looted warehouse on the nearby Tiber banks - Fasola, 1965).

Most physical evidence, however, suggests that material was generally collected as it was needed, from whatever sources were near to hand. We have already referred to the many lime-kilns found installed within the actual buildings being despoiled; to the likely removal of blocks from the Servian Wall directly to the foundations of ninth-century churches; and to the use of various Roman monuments for the construction of neighbouring churches. This seems to be the case generally for heavier materials: the selection of twenty-three capitals in the garden of S. Alessio on the Aventine represent the remains of the early medieval church; they were assembled from nearby Imperial monuments of the first to fifth centuries (Pensabene, 1982, 1ff). Here, it was obviously thought preferable to make do with an entirely disparate set from nearby, rather than to scour the city (or any hypothetical storehouse) for homogeneous capitals which would then have had to be hauled up to such an inaccessible site. To summarise, it may even be permissible to assign the (admittedly few) examples of smallscale spoliation, going to fill storehouses, to our "spolia middlemen". The largescale projects, involving the complete demolition of huge ancient monuments, would more likely represent papal works, carried out at the beginning of our period with Byzantine permission and, from the early eighth century onwards, independently - in conscious imitation of Imperial authority.
Chapter 3: Labour

3.1.1 Architects

Most of our texts refer only to individual architects after the beginning of the sixth century. Justinian's Novella VII, however, gives a clue to the general situation in 535. Here it is stated that before any church property can be leased to a private person, it must be inspected by "duobus per tempora primatibus mechanicis aut architectis". Outside the great cities, only one architect or mechanic will suffice, "si unum solum civitas habeat" (VII, 3, 2). Other evidence from the provinces bears out the suggestion that the architect was still a familiar presence in everyday life: Eugippius, writing in Campania in 509, refers casually to the benefits of employing a bona fide architect to build one's house if one wants a decent job done (Vita Sancti Severini, prologue 4); and at around the same time as Justinian's law, the architect Julian of Ascolan took the trouble to write a short text specifically regarding the legal aspects of private house-building in Palestine (Saliou, 1994).

The first - and only - references to architects in our period in Rome come in the Variae of Cassiodorus. Amongst the formulae for the appointment of the administration's officials we find the Architectus Publicorum and the Cura Palatii (VII, 15 & 5). Here we can detect several notable changes in the role of the architect from that of the Empire. Both posts are greatly concerned with the restoration and preservation of existing monuments and statues. Indeed, the Architectus Publicorum, appointed by the Praefectus Urbi of Rome, is given no other duty than the preservation of the city's "mirabilis Silva moenium".

The Cura Palatii is a more complex case. The post is not actually held in Rome, but in the court of Theoderic, that is, wherever the king was based at any one time. Scholars seem undecided whether the term palatii means "of the palace" in the sense of a
specific building or the administration in general (Della Valle, 1959, 158-60). Whatever, the position is an architectural one, relating to planning and restoring not only palaces ("nobis praetorii amoenitas blandiatur") but cities and fortifications. This emphasis on building is unknown in the Notitia Dignitatum's Cura Palatiorum, and neither is it found in the contemporary eastern "curopalate" (Rouillard, 1924). The connection of the architect to the royal court and his position at the head of a large body of artisans might in fact have more in common with the court architect of the later eastern empire, based in the Imperial household in Constantinople and supposedly sending plans for new buildings throughout the provinces (proposed by Underwood, 1948, 64 and Verzone, 1968, 16 & 25; there is a suggestion of such a post in CICC XII, 19, 12, 1). Theoderic's appointment does in fact seem to have been absorbed into the Italian Byzantine administration, where it is recorded as being held by Plato, the father of pope John VII, in 687 (see above, p. 16). By now, however, the link with the Imperial palace in Rome is assured: Plato's epitaph gives his full title as Cura Palatii Urbis Romae and singles out the one achievement of restoring the ramp from the Forum to the Palatine. If he was concerned with any other architectural duties, these are not mentioned.

The architect's role as presented by Cassiodorus' Cura Palatii departs notably from the traditional Vitruvian model, and points toward the great changes which the profession was to undergo in early medieval times. Firstly, he is told that he should seek to "blend the new work in with the old" (Hodgkin's translation for "antiqua in nitorem pristinum contineas et nova simili antiquitate producas"). As late as Faventinus (4th century), architects had been much concerned with the theoretical questions of eurythma or harmony - but never in terms of matching new work with old, only in balancing individual elements of their own structures. Cassiodorus is surely reflecting both the late Roman concern with restoring old buildings as opposed to beginning entirely new ones, and even the practical problems presented by the wholesale use of spolia. In the latter case, it is interesting that trouble is still taken to match new work (and materials) with old; obviously, the "new aesthetic" of using spolia in its own right, according to its own principles, had not yet taken hold (if indeed it ever did - if, that is, this concept is not merely a modern art histori-
cal idea; see, for example, Brenk, 1987; Romano, 1991, 59-60). A century later the importance of the art of restoration to the architect's profession had reached the point where Isidore of Seville felt the need to give it the same attention as new construction, something unheard of in his sources (Etymologiae XIX, 10, 1: "instauratio" and "aedificationem").

Equally important for an understanding of the early medieval architect is the passage relating to the Cura Palatii's position at the head of a long list of artisans: "the builder of walls, the carver of marbles, the caster of brass, the vaulter of arches, the plasterer, the worker in mosaic, all come to you for orders, and you are expected to have a wise answer for each. But, then, if you direct them rightly, while theirs is the work yours is all the glory." Here the role of the architect seems to approach that of the site foreman, or master-builder, who has knowledge of every craft and is also personally accessible to all the workmen. In Vitruvius, whilst the architect is certainly required to be competent in all building arts, his prime responsibility is for the "venustate, proportionibus et symmetris" of the finished work; any praise for the "subtiliter" or craftsmanship should be reserved for the "officinatoris", or supervisor of works (VI, 8).

So with Cassiodorus the architect seems to be moving down the scale, in a manner of speaking, towards the position of the officinatoris. A century later Isidore of Seville retains the planning role of the architect, but emphasises that he is also a mason or bricklayer: "architecti autem caementarii sunt qui disponunt in fundamentis" (Etymologiae XIX, 8, where "dispositio" should still be interpreted in the Vitruvian sense of preparing plans - Pevsner, 1942b, 234). In the ninth century Agnellus coins the Greek word "archiegetum" for the man in charge of the building of S. Stephanus during bishop Maximian's pontificate (546-554). Here we should detect the word architect itself gradually changing as the practice it describes moves towards "chief of works" (LPR 73). Closer to Rome, in the laws of the Lombard king Rothar (636-652), we hear of the Magistri Comacini (Blume, 1869, 29). The best translation of this post should be "masters of the association of masons"; from the two laws we learn that the chief mason hired the workmen on a building
site and was to be held responsible for any fatal accidents (Frankl, 1960, 111). Nothing is mentioned regarding the magister's role in planning buildings, but his very title makes him, in the terms of Isidore and Agnellus, an architect.

In Rome itself, although architects are never mentioned by name, we are often given the identity of the overseer of a particular building project. This usually relates to the direction of the labourforce, with no specific references to any technical building skills, let alone planning ability. Thus the popes themselves often take charge personally over the reconstruction of city walls and aqueducts (Hadrian I and Leo IV in Rome and Gregory IV at Ostia - LP XCVII, 59 & 62; CV, 39; Cl, 40). An inscription from the Leonine Wall names one "Agatho cv" of the domusculata Capracorum as the overseer of one particular gang of workmen (Gray, 1948, 113). Two other cases might refer to more technical supervision, being concerned specifically with the replacement of the large roof-trusses in the great basilicas - perhaps the most complex engineering feat of early medieval Rome. Hadrian I's vestiarius, Januarius - a "suitable person" - was placed in charge of the reconstructions of the roofs of S. Peter's and S. Paolo fuori le Mura, and Leo III's cubicularius Crisafius was dispatched to Ravenna with a team of workmen to repair the roof of S. Apollinare in Classe (LP XCVII, 64 & 67; LPR 168). The fact that Crisafius is sent with "reliquos caementarios" is a precious testament to the fact that he, at least, was a master builder working within the papal administration (Januarius, on the other hand, appears to have been working with a Frankish magister sent by Charlemagne - CC 65).

Agnellus' archiergatum is the closest we come after Cassiodorus to a literal reference to an architect - all others in our period are from outside Italy (Pevsner, 1942). However, occasionally the theoretical side of the profession is alluded to. In abbreviating Faventinus, Isidore copied his definition of the ichnographia or ground plan (areae vel solii et fundamentorum descriptio) but instead of using the actual Greek word he substituted "dispositio" to mean plan (Pevsner, 1942b, 233). His emphasis on foundations with regard

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1 Pevsner (1942b, 237) takes "ad opera dictandi" to mean "plan the building". In the context, "supervise the work" seems more suitable.
to planning echoes Eugippius remark that the foundations of a house will be the principal factor to go wrong if an architect is not employed for the job (p. 74, above). Similarly, the many descriptions of the laying of foundations in the Liber Pontificalis (3.1.2) should perhaps be taken to intend some connection with the actual conception of a building, with its plan as well as with the simple tufa or concrete substructures of the walls (cf. the almost synonymous usage of "foundations" and "plan" in Psellus, Chron. VI, 186).

The fact that the siting and planning of buildings and cities are often prepared with some kind of supernatural guidance is perhaps evidence of how rarified the idea of architectural conception was to writers of the time. Divine inspiration through dreams and visions is a commonplace of early Christian texts regarding the building of churches, particularly in the east, and even Procopius gives many such examples in The Buildings (Mango, 1979, 18; Procopius VII, 29ff & 111ff). Gregory I relates how the site and precise configuration of the monastery of S. Stefano de Montanis at Terracina was revealed to its abbot by a vision of St. Benedict (Dial. II, 22). The clearest example in early medieval Rome comes in the Liber Pontificalis' description of the founding of the new settlement of Cencelle by Leo IV in around 850. Here the precise plan for the layout of the city, with its two gates and churches, was revealed to the pope in a dream and then conveyed to the Magister Militum Peter for realisation, together with funding for the project (LP CV, 101-2). The fact that Peter himself was present in the revelatory dream and subsequently organised the construction of the city might suggest to the sceptical that the Magister Militum had a little more to do with the planning than he is given credit for. The anonymous eighteenth-century fresco in SS. Michele & Magno which shows Leo III holding the actual plan and elevation of the church might, in the context of Leo IV's role at Cencelle, be considered a copy of a Carolingian original (cf. also the interest in such matters displayed in Leo III's biography, 3.1.2, below).

In short we should admit that there is very little evidence for the fate of the architect in early medieval Rome. It appears that his duties to some extent became absorbed by the craftsmen who formerly worked under him, and who now organised the workmen and
the materials and liaised with the patron regarding the finance and the planning. It is noteworthy that even in the Byzantine east, Mango has arrived at a similar conclusion by way of entirely different sources (1978, 15-18). Furthermore, the Byzantine lexicon of around 1000, the Lexica Segueriana, defines "architekton" in terms remarkably similar to those recounted by Isidore and Agnellus, as "the supervisor of construction work; chief of carpenters or builders; one who fashions something with painstaking care" (Downey, op. cit., 109).

Why there should have been such a Mediterranean-wide displacement of the architectural profession in the period 500-1000 is a difficult question, perhaps leading us into the complex and poorly-understood subject of the fate of the education system. Briefly, Mango emphasises the breakdown in the guild system and its attendant schooling (op. cit. 15). We shall consider the question of guilds in 3.2. Another factor must surely have been the decreased demand for a profession capable of planning and carrying out more or less complicated new structures in an era which made so much use of converted ancient buildings, and whose new works were governed so greatly by the supply of re-usable materials. The situation of the architect here was almost bound to end with the anomalous, somewhat ridiculous figure of Theoderic's Architectus Publicorum, with his grand-sounding title, in charge of nothing more than moving old statues from place to place (Var. VII, 15).

3.1.2 Architectural Tracts

We now turn briefly to architectural tracts and their epitomes. How relevant they are to the general question of the practice of the architect is difficult to ascertain. Common sense dictates that they should at least aid the profession in simple practical terms: Cassiodorus instructs both the Cura Palatii and the Architectus Publicorum to "read the books of the ancients"; Procopius directs any readers wishing to learn exactly how Apollodorus of
Damascus constructed his bridge over the Danube to peruse the architect's own technical manual (VII, 273). However, when manuscripts of Vitruvius, Anthemius and Isidore turn up later in our period it is often difficult to know whether they were being copied for practical purposes or simply as part of the monastery scrinia's general duplication policy. In short, the most we could extrapolate from the presence of these tracts is that they serve as an index for the presence of architects, for the need or desire for architectural knowledge, even a continuity of learning and organisation within the building trade; at the least, they present the potential for all of these.

Vitruvius' De Architectura is the most complete Latin work relating to architecture. How useful, or popular, it would have been to architects of the sixth century is uncertain: Faventinus had already begun to confuse Vitruvius' Hellenistic subdivisions of the discipline by around 400 AD and they are completely absent in Palladius, a century later. Julian of Ascolan, however, writing in sixth-century Palestine, follows and expands Vitruvius' element-by-element classification, and updates his passage on building regulations (Saliou, 1994, 216ff). Of the typological sections of Vitruvius, fortifications had changed greatly even before the Byzantine strategists' textbooks of the sixth century, and forums, temples, theatres and palaestrae had ceased being built altogether. Obviously, nothing will be found in Vitruvius regarding the only types of new buildings which were erected throughout the early middle ages: churches, oratories, baptisteries and cemeterial structures. Regarding the link between Roman and early Christian basilicas, it is noteworthy that neither S. Giovanni in Laterano nor S. Peter's used Vitruvian basilical proportions (Heitz, 1974, 747). Sidonius Apollinaris still refers to Vitruvius in the late fifth century as "primis architectusque", although this may be typical of this author's nostalgic antiquarianism rather than a reflection of contemporary practice (Epistulae VIII, 6, 10). Perhaps more important is that Cassiodorus makes no mention of him when listing the ancient texts of use to the Cura Palatii: Euclid, Archimedes and Macrobius are favoured². This might

² It is strange that Macrobius is recommended; Cassiodorus might be harking back to Vitruvius' idea that the architect should be a man of wide culture, or else he might have in mind some lost work of Macrobius. Considering that the manuscript used by Mommsen actually gives "Metrobio" it is not impossible that Vitruvius was in fact intended (particularly as Cassiodorus usually refers to Macrobius as "Macrobius Theodosius" - Cameron, 1966, 26).
suggest the importance of geometry and mechanics to late Roman architects (testified - at
least in the east - by the works of Pappus and the backgrounds of Anthemius and Isidore
of Tralles - Downey, 1948); and the relevance of Archimedes is borne out by the actual
drainage projects organised precisely by Theoderic and Cassiodorus (Var. I, 45; II, 21 &
32).

The more practical parts of Vitruvius would obviously contain much valuable
information for early medieval craftsmen: the selection and use of timber, the manufacture
of mortar and concrete, and his directions for finishing and decoration in particular -
indeed, it is precisely some of these that are preserved in the early medieval texts consid-
ered below. But even here, much would be out of date by the sixth century: the ancient
methods of wall-facing (particularly apparent when one considers the various pseudo-
Vitruvian terms devised by archaeologists to describe late Roman and medieval walls), and
above all the exclusive concentration upon new materials; a treatise on the sources and
uses of spolia would have been more relevant for Rome (as well as for modern archaeolo-
gists!). The fact that our earliest complete manuscripts come from the Carolingian Empire
has suggested to some that the text was principally of use in the middle ages to the new
peoples of Europe, unfamiliar with building traditions which survived more-or-less unbro-
ken in Italy (SSCISAM 22, 753ff). However, there is evidence that at least certain chap-
ters of both Vitruvius and Palladius were used in early medieval Italy (see below); and by
the time of Desiderius in eleventh-century Monte Cassino it seems that not only was the
full text known, but even that the Vitruvian circle was actually used to plan the new
basilica (Thieme, 1976).

The only work to compare with Vitruvius which was compiled during our period is
Isidore of Seville's Etymologiae, that is, Books 15 (on building typology) and 19 (on
building materials and techniques). Written in Visigothic Spain, the entire work was
completed by Isidore's death in 636, and comprised an illustrated encyclopaedia of the sum
total of Classical learning, presented to the rulers of the new kingdoms of the Visigoths
and Franks (Saxl, 1957). Scholars seem agreed that his sources were generally late,
usually fourth and fifth-century epitomes, and the chapters relating to building were probably developed from Faventinus rather than Vitruvius (Hillgarth, 1983, 848; Pevsner, 1942, 590). Judging from the number of extant manuscripts (950) it must have been one of the most popular works of the middle ages. Unlike Vitruvius, medieval manuscripts of Isidore are comparatively numerous in Italy; the earliest known complete copy is an eighth-century manuscript from Monte Cassino (Reydellet, 1966, 390).

Isidore's chapters relating to architecture, then, were available in early medieval Italy, at least as close to Rome as Monte Cassino. But there is absolutely no evidence that they were used by builders or architects. Nor, really, would they have served the purpose very well. They form a very small part of the whole work, and individual terms are presented primarily for their etymology, not in the manner of a practical guide. The few passages which depart from any of his models are probably a better guide to practice as Isidore saw it in his native Spain rather than to innovations to be adopted in Italy. Thus we see an unusual and complicated emphasis on carpentry, especially roof-building, but nothing on concrete vaulting (even domes are to be constructed of timber); hand-tools are listed quite comprehensively, yet there is nothing on the labour-saving machines of Vitruvius' book 10. The Etymologiae were virtually copied wholesale by Hrabanus Maurus in his "De Naturis Rerum", compiled in ninth-century Fulda. Our earliest manuscript, which also contains illustrations of late antique origin, was copied at Monte Cassino around 1022³ (Panofsky, 1967).

Two other texts concerning building are known from the early middle ages, both compilations of Classical works. As with Vitruvius, there is no direct evidence that they were available in the city of Rome, although it is likely they were used, or even originated there. The compilation of metallurgical "recipes" known as the Mappae Clavicula originated from an Alexandrian Greek collection of texts, in turn deriving as far back as seventh-century BC Mesopotamia. Our earliest Latin collection was copied at Lucca between 787

³ The illustrations, many of which are reproduced by Amellis (1896), seem to be closer to actual ancient technology than is the text: that of a glass furnace, in particular, is matched very closely by an excavated example in eleventh-century Byzantine Corinth (Davidson, 1940, 304).
and 816 AD, by which time several chapters relating to building construction had strayed in, which seem to be derived almost directly from Vitruvius (Johnson, 1939; this manuscript is known as the Compositiones Variae). The actual title Mappae Clavicula is referred to for the first time in a monastery catalogue from Reichenau of 821, and from the tenth century onwards manuscripts contain more chapters relating to architecture, including three - 101 & 254-5 on foundations, lime, sand and brick walls - which are taken directly from Palladius I, 8 & 10-11. The practical use of these texts is debatable; Johnson believes the pigments, solders and gildings of the metallurgical recipes were followed even by the very monks copying the manuscripts (1939, 17-18), whereas Smith & Hawthorne are far more cautious (1974, 15). There is, however, an interesting coincidence between the Mappae Clavicula's architectural information and the biography of Leo III in the Liber Pontificalis (written around 816). We have already commented on the interest shown in building materials by the author of the latter text (pps. 50, 54, 59 & 68, above), and in particular his references to "firm foundations" at S. Susanna, S. Stefano degli Abissini and the first Lateran triclinium (LP XCVIII, 9-10, 90). The first description is quite detailed: "noviter in altum fodiens firmissimum posuit fundamentum, et eruta planitie mirafice excelsa super ipsa fundamenta aedificavit ecclesiam." When one considers that the fullest surviving manuscript of the Mappae Clavicula, in addition to the chapter describing the importance of foundation systems ("De Dispositione Fabricae", 101), contains a passage specifically relating to levelling ("planitie", 213), and also both texts' reference to opus signinum (LP XCVIII, 92; Mappae Clavicula 103 & 293A), suspicion arises as to whether Leo's biographer was acquainted with the technical texts. The actual Lucca text (which, being somewhat fragmentary, does not contain the chapters on levelling and foundations) is bound with a copy of the Liber Pontificalis which ends precisely with the biography of Hadrian I, Leo's predecessor; both texts were copied by the same scribes at the same time (Johnson, 1937, 12-21; LP ed. Duchesne I, clxv). Considering that the original Liber Pontificalis text was certainly compiled in Rome, can we assume that the Mappae Clavicula extracts were sent to Lucca from the Lateran scriptorium in the same consignment of original manuscripts? And even that Leo III's biographer, being in charge of the establish-
The Corpus Agrimensorum, a compilation of (mostly) ancient works relating to cartography, land-surveying and geometry, was much-used in our period (Dilke, 1971, 126 & ff). The two earliest manuscripts are of the late fifth or early sixth centuries; one seems to be the actual copy owned by Gerbert (Sylvester II) at Bobbio, and considering that the monastery's founder, St. Columban, is reputed to have bought Cassiodorus' library at Squillace, it has been suggested that it was even the senator's own manuscript (Dilke, 1967, 11). Later copies include passages from Isidore of Seville. Most manuscripts are illustrated, and there is evidence that such instructions as the planning of a city according to the cardo and decumanus were followed in late medieval Italy (Heitz, 1974, 739). Although no copies survive from Rome, evidence that the actual craft was being pursued there during the sixth and seventh centuries suggests that the textbook remained in use in the city (see 3.2 below).

A concentration on technical texts, however, should not imply that architectural terms survived throughout the early middle ages solely by literary means. Mastrelli and Pellegrini have drawn attention to the continuity of surnames derived from trades in Italy and of technical terminology relating to building crafts (1970, 297ff, 329). The very un-literary property documents preserved from tenth-century Rome constantly utilise Vitruvian terms such as centenaria, fistula, machinationibus, tegulae, pilae tiburtinae etc (Hubert, 1990). Survival of such utilitarian terminology is clearly due to its everyday relevance in these cases. Smith and Hawthorne put the case against the usefulness of texts very forcefully: "one cannot help but feel that the record of medieval techniques that is preserved in surviving objects is more valuable in checking and interpreting the written sources than the latter are for interpreting the objects" (1974, 16).

4 Agnellus of Ravenna, a near contemporary of Leo III's biographer, is even more noteworthy for his wide use of building terms for techniques and materials (see above, p. 35). And his descriptions of such Byzantine buildings as S. Vitale and the baptistery of the Petriana basilica emphasise the mathematical purity of their construction: "structis aritmeticae artis" (LPR 50); "nulla in Italia ecclesia simulis est in aedificiis et in mechanicis operibus" (57). The survival at Bobbio of a mathematical text, apparently of Ravennic origin, by Anthemius of Tralles, the architect of S. Sofia, is interesting in this light (Troncarelli, 1987, 710).
3.2 Craftsmen

Here we consider the fragmentary evidence for the various building trades in Rome during the early middle ages. Texts in our period generally distinguish artisans from both architects (even, as we have seen above, if the latter are merely "caementarii qui disponunt in fundamentis") and unskilled labourers (Procopius II, 195). The bricklayer is marked off from the hod-carriers and mortar-mixers in a late antique illustration of Maurus by his rich tunic (Amelli, 1896, pl. 3). Late medieval documents in Rome clearly divide "magistri" from "manuales"; the former - who are often property-holders - consist of carpenters and masons, while the latter attend to such duties as lime-slaking and quarrying (Hubert, 1990, 224-9).

Craftsmen in the Roman period are generally believed to have been organised into various associations (collegia or corpora), the evidence for which is taken from the legal sources and from inscriptions. We know, for example, of the existence of associations of metal-workers, marble-cutters, building surveyors, pavers, demolition-workers and masons during the early empire (Waltzing, 1889 II, 122). The precise nature of such collegia, however, is far from clear. By the end of the third century it seems that membership of the collegia connected with the annona and other public services was both compulsory and hereditary, and members were not permitted to change their occupation or district (Ruggini, 1970, 109, 138; De Robertis, 1973, 130ff). Faced with the problem of a shrinking workforce, Constantine and his successors took steps to amalgamate various collegia and increase members' workloads, with the counter-productive result that individuals sought to escape from the organisations altogether, often seeking refuge with the church and other great land-owners (CTh XIII, 5, 13; XIV, 1, 9; 2, 4; 7, 1; 8; Ruggini,
1970, 180ff). At the same time, however, we should imagine the parallel existence of a private sector of free collegia that tended to elude documentation in the Theodosian Code (De Robertis, 1973, 165, 185ff).

This was essentially the situation at the start of our period. Fifth-century novellae -of Valentinian III (20), Leo I (2) and Majorian (7, 3 & 7) - repeat that collegia members in Rome continue to escape their duties; the same problem was also affecting the administration of the aqueduct offices under Theoderic, although here the escapees are probably unskilled labourers (Var. III, 31 - see 3.3, below). Theoderic retained two older laws regarding the illegal exemptions and flight of collegiati and administrators in his Edict of around 500 (LXIX-LXX). The Corpus Iuris Civilis repeats some of the laws of the Theodosian Code regarding escaping corporation members, so the problem must still have seemed relevant in the sixth century (CICC VIII, 11, 1; XI, 6, 7). There are, however, no new laws regarding fugitive artisans - of more concern are agricultural workers leaving their farms for monasteries, and bankers claiming membership of the Church in order to avoid paying tax (CICC I, 3, 34; CICN CXXIII, 35; I, 2, 9). De Robertis has postulated that between the last of the Theodosian "centralising" laws and the collection of the Justinian's Corpus there was a move toward autonomy in the organisation of the public collegia, with the state giving up its attempts to control workers and coming to rely more and more on the private sector (1973, 205ff; the agreement between builders and the chief magistrate of Sardis in 459 shows, however, that even in the private sector individual trades had amalgamated in order to increase their bargaining power - Buckler, 1953, 983). Later laws continued to concern themselves chiefly with the control of agricultural workers and public servants, particularly soldiers: in 592 the emperor Maurice passed a new law forbidding them from joining monasteries (Reg. III, 61 & 64; VIII, 10). Gregory himself warns that farm-workers continue to pass illegally into the possession of the Church (Reg. I, 39a). Nowhere are there any specific references to the movement of building workers.

The role of the Church in harbouring such escapees is interesting with regard to
building craftsmen since it is often suggested that during the early middle ages all such artisans were under purely ecclesiastical control (Johnson, 1939, 86 & 95; Ruggini, 1970, 183). As usual, evidence is very sparse. We have discussed the regional basis on which the Church in Rome was organised and how this was partially reflected in the financing of church maintenance (1.2, above). Considering that Novella 2 of Leo I states that fugitive guild members in Rome are to be found "in the number of clerics, even to the rank of subdeacon", we might imagine that the church organisation was utilising men of practical ability in its organisation of building projects, that is, men from the actual building collegia. There is, of course, no precise evidence as to which collegia were specific offenders: Majorian's Novella of 458, mentioned above, states that such escapees were subject to "obnoxius functionibus sive muniiis" and "operas patriae", which would include manual workers (7, 3; 7, 7). Gregory I's letters regarding building operations are often addressed specifically to subdeacons: Sabinus, in charge of the timber-felling and transport of beams from Calabria to Rome; Anthemius, the Campanian subdeacon charged with the collection of lead for the repair of Eumorphian monasteries, who is probably the same Anthemius, subdeacon of Misenum, responsible for the maintenance funds of other buildings in the district; and Felix, subdeacon of the Appian patrimony, who is to arrange the huge donation of land for the lighting of S. Paolo in Rome (Reg. IX, 124-7; I, 48, IX, 121 & IX, 190; XIV, 14).

However, whilst there is enough known about the officials of the papal administration for a fairly detailed hierarchy of posts and duties to be drawn up, it is instructive that there existed no single position that was concerned only - or even specifically - with building works, let alone any recorded group of "church craftsmen" (Noble, 1984, 213-255; see 1.2, above). As stated earlier, we must either assume that such a group did exist, but was never recorded in our texts (and Agnellus' casual reference to Leo III's chamberlain Crisafius being a caementarius might be a suggestion of this) or else that building craftsmen in our period operated in the private sector and were employed by the Church as and when they were needed (these two assumptions are not mutually exclusive, of course). We shall discuss this second hypothesis shortly; regarding the question of "church
craftsmen" we will first consider the post of praepositus.

The praepositus appears in inscriptions from around 500 AD, and is seen as a clerical post, perhaps inaugurated by pope Symmachus to oversee maintenance and the sale of cemetery plots (Guyon, 1974, 580-4). More specific evidence that the praepositus supervised building work comes from the inscribed lead fistula from S. Lorenzo (p. 43, above). Here the praepositus Stefanis is stated to have repaired the water-supply during the time of pope John I. Gregory I says that the principal workman carrying out repairs close to the tomb of St. Paul was a praepositus (Reg. IV, 30). De Rossi believed that each major cemeterial complex had its own praepositus and that their organisation was on the same regional basis as the deacons (1864-77 III, 520ff; this would not explain the burial of Eugenius, the praepositus of the S. Ermete cemetery, at S. Saba - CBCR I, 197). The Liber Diurnus formula for appointment of a praepositus does not specify a cemeterial location; it suggests that his role was chiefly to control expenditure rather than become involved in the actual work himself (LXVIII).

There is further evidence that fleeing building craftsmen at the end of the Empire found a home in the Church, in this case the monasteries. As late as Gregory I's time monks were still largely laymen, thus making centralised supervision particularly difficult; the monasteries themselves were also often simply the converted houses or farms of rich landowners. The emperor Maurice's above-mentioned prohibition on public servants entering monasteries shows that they were also the natural successors of the great private estates as a refuge for fugitives. Those monasteries established by the Church in Rome were first founded at the great cemetery complexes of S. Peter's, S. Sebastiano and S. Lorenzo by Sixtus III, Leo I and Hilarius in the mid fifth century, at precisely the time of the greatest exodus of collegia members. The abbot of such a basilical monastery would also be in charge of the neighbouring church's maintenance, as we learn from both the Liber Diurnus and Gregory I's founding of S. Victor's monastery at S. Pancrazio (LD LXXXVII, regarding S. Stephanus at S. Paolo fuori le Mura; Reg. IV, 18). In another of Gregory's letters we learn that at least some of Pelagius II's building work at S. Lorenzo
fuori le Mura was carried out by "the monks and mansionarii" (IV, 30; Gregory actually refers to excavations undertaken to locate St. Lawrence's tomb, but we know that Pelagius also built the small galleried basilica - CBCR II, 135-6). A ninth-century inscription from the same basilica records restorations to the chancel carried out under the higouménos Arsenios (CBCR II, 13). Perhaps the clearest evidence that some monks were builders comes from the tenth-century fresco in the oratory of S. Saba which shows a Benedictine monk holding a bricklayer's trowel, and beneath, a painted inscription: "Marti / nus mo / nachus / mag(ister)" (Wilpert, 1917 IV.1, taf. 189.8). Outside Rome, monastery complexes tended to be almost self-sufficient in technological terms. Brick kilns have been found at S. Vincenzo al Voltumo and S. Cornelia at Capracorum (Mitchell, 1990, 199; Christie, 1991, 36ff; cf. 2.5, above, where a concordance was observed between the names of certain monastery properties and Roman officinae around Farfa).

Regarding our second category - "secular craftsmen" - literary sources give a picture of a thriving civil sector working entirely outside church control at the beginning of our period. We have quoted Cassiodorus' long list of artisans in the employment of the Cura Palatii; and it was specifically from Rome that the mosaic and marble workers were drawn to work on Theodoric's Basilica of Hercules in Ravenna (Var. I, 6). These last were to be sent by the Praefectus Urbi, so it is likely that they were state employees; elsewhere in the Variae, however, it seems that workers were contracted from the private sector: the water-diviner and mechanic, both to be sought out and brought to Rome with funds released from the privy purse (III, 53); the chartarius to be dispatched to Calabria (IX, 3); and the land-surveyor to be recruited by Consularis (III, 52). The importance of the latter profession in property disputes ensured its continuity at least to the time of Gregory I, who sent an agrimensor from Rome to resolve litigation over monastery lands in Sicily (Reg. VII, 36). Gregory emphasises the fact that such work is outside the sphere of the Church when he states that Cyriacus, the bishop involved, is "inexperienced in secular causes".

5 Mansionarii formed scholae under the authority of primicerii (De Rossi, 1864-77 III, 530). A late property document shows their schola operating at S. Maria Nova in 1011 (Fedele, 1900, 187).
Indeed, there is a large bibliography which attempts to chart a continuity of building and other guilds from the Roman through to the later medieval periods. The exiguous textual evidence would suggest that, if they did exist, they would certainly have been in the private sector. Gregory I was petitioned by the corporation of soap-makers in Naples when a rich property-holder started to lure members into his own service (Reg. IX, 113). Elsewhere Gregory uses the word "ars" in conjunction with such professions as baking and dying, which has been interpreted as meaning corporation (Leicht, 1936, 215); at the same time in Rome we have inscriptions from the "arte argenti", some of whose members were buried at S. Maria Antiqua (Lipinsky, 1961, 8-9). The word "ordo" appears in the Theodosian Code applied to the trade of baking as early as 398 (XIV, 3, 20); Tomassetti interprets its reappearance in a document of the 769 Council of Rome ("alii ordines") as a testimony to the existence of private guilds in the city at the time (1906, 245). As surviving property documents proliferate from the tenth century, so we find increasing references to "scholae" of various trades. Our earliest evidence for a schola of builders, however, is that of the "muratores" in a twelfth-century text (Leicht, 1936, 223). Indeed, none of the specific references to building craftsmen in Rome during our period place them in any kind of organised grouping. Neither do the texts after Cassiodorus give any rich variety of individual crafts; builders are indiscriminately termed "artificii" (the rebuilders of the Aurelianic Walls under Gregory III - LP XCII, 15), "caementarios" (those who reconstruct the roof of S. Apollinare in Classe - LPR 168), "operarii" (at Leo IV's Cencelle - LP CV, 104), or "opifices" (Theobald, benefactor of S. Valentino, in an inscription of 899 - CBCR IV, 291).

Whether or not we assume that builders were grouped into associations with some kind of legal status, even organised by the Church, there must have been a system of training in the individual trades. The conscious imitation of building forms and techniques throughout the early middle ages is testified by physical evidence as well as literary sources. Cassiodorus mentions this in his formula for the appointment of Rome's Architectus Publicorum: "let him read the books of the ancients; but he will find more in the city
than in his books" (Var. VII, 15). This seems to have held good also for more humble artisans: the sixth-century Greek historian Choricius tells us, in his praise of the church of S. Sergius in Gaza, that students of painting and sculpture were in the habit of copying particularly fine details of their crafts from existing buildings (Downey, 1948, 109). The general unbroken tradition of typology (basilicas, porticoes, triclinia) and techniques (apse-vaulting, truss-roofing, concrete wall-building) in early medieval architecture in Rome is a better guide to such practice than the handful of examples of specific copying which command attention precisely by their curiosity. Cases such as the apse mosaics of S. Prassede and S. Cecilia, taken from the sixth-century SS. Cosma & Damiano, or the imitation of an entire ground-plan, as at S. Prassede (from S. Peter's - CBCR III 259) suggest that ideological rather than technical motives are at work. The marble-workers of John VII's S. Maria oratory copied the antique spolia pilasters which made up the majority of its architectural decoration in a most precise manner, but again this proves an exception (L'Orange, 1969): the repetitiveness of most early medieval carving in the city shows that, in general, a less discerning attitude prevailed.

It is in fact in the field of architectural decoration - carving, painting and mosaic-work - that most research has concentrated regarding craftsmanship in early medieval Rome. Despite occasional attempts to consider such crafts from a purely technical viewpoint, the most common means of enquiry has been stylistic. Once the styles have been distinguished, a dating sequence is established, and a search for "influences" proceeds. Consensus occasionally emerges, but opinions naturally vary. In such a field, the only sure test of an art-historical theory is where it can be confirmed by objective means: for example, where motifs common from marble sculpture appear on timber which can be carbon-dated, as with the ninth-century decorated beam casings at S. Sofia in Istanbul (Sheppard, 1965, 237); or, in the field of fresco painting, where a microscopic analysis can be made of the number of layers of intonaco in order to confirm the number of phases of decoration (Melogrami, 1991, 141ff). Datable inscriptions are extremely rare for worked marble, on which, as the only of these techniques strictly connected with the building industry, we will concentrate here.
Analysis of the numerous plutei or choir screens of the early middle ages has led some commentators to posit a change in the use of hand-tools in the period, notably a decline of the drill and a complete reliance on the chisel and punch (L'Orange, 1969, 116; Macchiarella, 1976). Isidore provides evidence for the use of the sand-saw for cutting thin slabs of marble, which would be of use not only to opus sectile workers but also carvers and sculptors (XIX, 13; the illustrations for the 1023 AD manuscript of Maurus depict craftsmen sawing colored marble sheets, and deposits of sand were found in the eleventh-century marble-cutter's workshop excavated on the Viminal - Amelli, 1896, pl. 119; Lanciani, 1892, 241). The only actual names of such artists that have come down to us from early medieval Rome are preserved as signatures on their work: Stephanus, who carved the well-head at S. Giovanni a Porta Latina; Ursus and Martinus, who inscribed their ciborium for Leo III; and Joannes of Venice who signed his door frame at S. Maria in Cosmedin. All are in the stylistic ambit of late eighth and early ninth-century work, the first perhaps connected with Hadrian I's enrichment of S. Giovanni, the last often attributed to the ninth century (ed. Macchiarella, 1976, 271; Pani-Ermini, 1974, 115; Gray, 1948, 119).

The most important question relating to artisans, in this case sculptors or stone cutters, to have been extrapolated from the study of plutei styles is that of "eastern craftsmen". There can be no doubt that the style of marble carving found in many sixth-century contexts in Rome - the furnishings of S. Clemente, certain column bases and plutei at S. Lorenzo fuori le Mura, the parapets of Narses' Ponte Salaria - bears an extremely strong resemblance to contemporary work at Constantinople. Earlier theories that this betokened the presence of workmen from the eastern capital in Rome (Russo, 1984) have since been superseded by the idea that all such examples were produced at the quarries of Proconnesos and exported fully-worked: not only is all such marble Proconnesian, but factory marks found on pieces at S. Clemente have also been identified as originating there (Guidobaldi, 1992, 257; see 2.3.2, above). Perhaps the most incontrovertible evidence for this latter theory is the underwater excavation of a shipwreck at Marzamemi, off Syracuse.
The ship was fully-laden with the marble components of an entire "prefabricated" basilica, the majority of which were finished Proconnesian workmanship, some of whose motifs were identical to the plutei of S. Clemente; the date of the wreck was Justinianic, and the shipment was perhaps bound for Africa (Kapitan, 1980). A final indication that it was the material rather than the sculptors that was drawn from the east is that the Ostrogothic rulers in Ravenna requested only marble from Constantinople (Var. X, 8); the actual marble-cutters, as we have seen, were to come from Rome (I, 6).

This theory of the presence of easterners at work in Rome comes up again at the time of John VII (indeed, it re-surfaces whenever an artefact or building displays eastern stylistic influence). The problem is a familiar archaeological one, that of the movement of "people or ideas?" Admittedly, in certain obviously anomalous cases where, against an entirely homogeneous background, a new, demonstrably "foreign" artistic style appears, executed in securely-identified "foreign" techniques, we might assume we are in the presence of a "foreign" workshop. However, in the case of John VII, where very little art or architecture survives from the periods immediately before and after, and whose pontificate marks one of a century-long reign of eastern popes, it seems to me that to distinguish between a specifically eastern workshop and an indigenous background that must already have been assimilating eastern influences for nearly two hundred years is tenuous to say the least (Verzone, 1968, 184; L'Orange, 1969, 118; Nordhagen, 1965).

Secure evidence for travelling eastern artists remains to be found. Some literary testimony proves the exception: Zachary of Mitylene tells us that the deputation sent to pope Agapitus from Constantinople in 536 included one Eustace, an architect from Amada (IX, 19). And the Liber Pontificalis biography of Benedict III reports that an eastern painter-monk, Lazarus, was sent to the pope on an embassy from the Emperor Michael around 855 (LP CVI, 33). Of interest in relation to the first reference is Rivoira's supposition regarding Anthemius of Tralles and the origins of S. Sofia: he imagines the Greek architect visiting his brother Alexander, a doctor living in Rome, and exploring the decaying halls of the Baths of Diocletian, assimilating ideas for his masterpiece in Constantin-
pie (1910 I, 79; the source for Alexander is Agathias V, 6). If we accept the two references as anything more than isolated cases, we might imagine that they represent casual examples of a wider artistic and architectural exchange of personnel; however, we would still need the sure archaeological evidence for the physical presence of eastern workmen in Rome, and as we have observed above, this continues to elude us.

With Eustace and Anthemius we have returned to actual building technology. One important piece of evidence relating to architecture in early medieval Rome which goes beyond the purely stylistic is the use of the Byzantine foot in church plans. Krautheimer notes it at S. Agata dei Goti, S. Agnese fuori le Mura, S. Ermete, S. Giovanni a Porta Latina, S. Lorenzo fuori le Mura, S. Pudenziana and S. Sinforosa (CBCR I-III). To leap from this observation to the conclusion that these buildings were erected by eastern architects and craftsmen, however, would be akin to assuming that any modern measurement in centimetres betokened the presence of French craftsmen. There must, of course, be some reason for the use of this unit, and it is not impossible that it signals some role played by Byzantines in building in Rome. Krautheimer suggests a combination of native workmen and eastern military engineers (1980, 97; he prefers architects in CBCR). A parallel situation seems to have existed in contemporary Palestine: in laying down the fifteen-foot clearway to each side of the Jerusalem aqueduct, a Justinianic inscription reproduces the actual measurement as a scale, obviously implying that the Byzantine foot depicted was not the only unit commonly used. A measuring-stick found on the mosaic-floor of a seventh-century ecclesiastical farm in western Galilee demonstrates the alternative measure, that is, the cubit (Geiger, 1992, 38-9). Whether we can posit an "official" unit of measurement for state projects here, being used hand-in-hand with the local type, is very difficult to say with such slender evidence. In Rome we have mentioned the churches supposedly founded by Narses (1.1, n. 6, above); S. Giovanni a Porta Latina is the only one to preserve the eastern measure. Considering our absence of proof for eastern crafts-

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6 His evidence is that dimensions break down to rounder - but by no means exact - figures of Byzantine feet than Roman feet. The following factors confuse matters: various sizes are given for the Byzantine foot (308-320mm); measurements from some of the buildings can be by no means exact; measurement-taking and measuring-sticks in ancient times were notoriously inaccurate in the first place (Underwood, 1948, 65).
men in the fields discussed above, it might be safer at this stage to withhold any judgment in favour of eastern architects until we have a conjunction of various types of evidence regarding a single building, such as the sure testimony of the use of Byzantine feet in a building known to have been founded in the west with eastern funds.

3.3 Unskilled Labour

The bulk of the workforce on any building project during the period was provided by unskilled labourers, and, it seems, by unpaid labourers. In this heavy reliance on the corvée we see complete continuity with the Roman system of "munera". The clearest definition of these public duties comes in CICD L, 4-6. Labouring (munera sordida corporalia) was distinguished from service which involved the outlay of sums of money (ea quae sumptibus expediuntur), that is, public office (CICD L, 5, 8, 4). Interestingly, all collegia members connected to the building trade - architects, craftsmen, surveyors, lime-burners and even ditch-diggers - were exempt from the former, but principally on the grounds that their jobs involved a proportion of compulsory service anyway (CICD L, 6, 5-6). Under the later Empire certain building projects became compulsory for all previously immune classes and corporations: the building and restoration of city walls and roads (CTh XV, 1, 49; XV, 3; Novellae of Valentinian 5.3; 10.3; CICC X, 48, 3), and, for Constantinople, aqueducts and the port (CICC VIII, 11, 7). Early in the fifth century churches were added to the category of non-base employments in order that all classes would be compelled to work for their upkeep: in these cases property-holders would be expected to contribute with money, and all others through physical work (CICC I, 2, 7; XI, 74, 4).
It was this state of affairs, with the largest possible number of buildings included for compulsory labour, which was continued throughout the early middle ages in Rome. Theoderic's decree to repair the Aurelianic Walls was addressed to "all the Goths and Romans" (Var. I, 28). The aqueduct office still had a permanent labour force consisting of slaves (III, 31). And there is evidence from outside Rome that Theoderic used forced local labour to build his country palace in the valley of Bidente near Forli (Vita Sancti Hilarii - Iacopi, 1943, 204; CICC XI, 74, 4, considered above, included imperial palaces amongst those categories of building which required compulsory labour). Justinian added no new laws relating to the corvee, although all those mentioned up to now were retained in the Corpus Iuris Civilis. Contemporary sources often refer to the misery caused to the populace by Justinian's exactions, usually with regard to taxation - even the emperor admits the problem in many new laws relating to the control of corrupt revenue officials (CICN XVII, 4; CXXVIII, 16-18; CIL, 1-2). The hostility shown towards Narses in some of the texts may well reflect the fact that his Italian building projects included unpopular forced-labour requirements (LPR 95; LP LXIII, 3-5; p. 14, above).

There is evidence to show that the levying of compulsory labour continued throughout Italy during the seventh century. The term "angaria" of the Roman law codes refers strictly to the compulsory service of transporting state goods and individuals (Frend, 1956); Brown sees it used more widely in both the Summa Perusina and the letters of Gregory I to cover forced labour in general, although none of the references he cites concern building works (1984, 116). Gregory's felling and transport of timber from Bruttium to Rome involved such a system - although, here, he does not refer to "angaria" (p. 39, above). Mengozzi produces further, rather vague references for such work from the Lombard territories during the seventh and eighth centuries, based chiefly on Paul the Deacon's description of the "populi adgravati" (1914, 123ff). There is, however, no precise evidence for any single building work in Rome itself utilising compulsory labour between Theoderic's repair of the city walls and the projects of the late eighth century. The Byzantine government would have been authorised to exploit the legal measures discussed above, but, as we saw in 1.1, it seems that state works in the period were minor.
The Church would have been authorised to avail itself of CICC I, 2, 7, above, for ecclesiastical buildings. Thus we might imagine that the larger structures of the period - SS. Apostoli, S. Lorenzo fuori le Mura, S. Agnese fuori le Mura and S. Pancrazio - were all constructed in this way.

It is only with Hadrian I's Liber Pontificalis biography that clear textual references to the corvee re-appear. The expression is always "agregans multituidinem populi" (or a slight variation), and it occurs only with reference to the rebuilding of the Traiana and Claudia aqueducts, the replacement of beams at S. Paolo, the demolition of the ruin threatening S. Maria in Cosmedin, and the second reconstruction of the Aurelianic Walls (LP XCVII, 59, 62, 67, 72, 92). It is interesting that, of all the numerous building works listed, only these are stated to have employed a corvee. Certainly the walls and aqueducts would have required the largest numbers of unskilled labourers: they were the largest monuments of all, and, according to Geertman's interpretation of the chronology of the text, they absorbed the entire resources for whichever indiction in which they were rebuilt (1975, 29-30). Furthermore, it seems that labour was levied from specific areas for specific monuments: the Aqua Claudia called for a levy from the districts of Campania, that is, those territories through which it ran; the city walls were worked on by "totas civitates tam Tusciae quamque Campaniae...cum populo Romano eiusque suburbans necnon et tota ecclesiastica patrimonio" (LP ibid.; see p. 57, above, for suggestions that this represents the ancient duty of supplying lime). In the same way, we might assume that the domusculata of Galeria was responsible for the great works on the Aqua Traiana, which ran through its lands.

On the other hand, there would seem no reason for the use of the corvee in rebuilding the roof of S. Paolo but for none of the other churches (especially since, as we have seen, there was the same ancient precedent for enlisting labour for churches as for city walls). When Leo III's builders repaired S. Apollinare in Classe, Agnellus tells us that "omnes suburbanæ civitates veniebant...Ravennenses civis voluentes in angaria cum funibus et ingemas" (LPR 168; "angaria" here certainly seems to imply labour as well as
transport). The only other specific reference in the Liber Pontificalis to the building of a church by corvee occurs in the unusual passage appended to the life of Sergius II (CIV, 40ff). Here we learn that the pope's brother, Benedict, abused powers confirmed to him by the emperor Lothar in imposing "unceasing vexations" on the people of Rome through various public works. Amongst these exhorbitant services was numbered the construction of S. Martino ai Monti; it is even claimed that the dilapidated condition of the original building was simply a pretext for its demolition and the unnecessary erection of the new church. Duchesne suggested that Benedict might have been one of the two "missi" appointed as a result of Lothar's Constitutio Romana of 824 and that the Liber Pontificalis passage was compiled by a party hostile to him and his brother (LP ed. Duchesne II, 103, n. 28-30).

The majority of the mid ninth-century projects which we are told relied on the corvee, however, continued to be the rebuilding and new construction of city walls: Gregory IV's new town of Ostia (Gregoriopolis), Leo IV's work on the Aurelianic Walls and the Leonine Walls, and Nicholas I's rebuilding of Gregoriopolis (LP CIII, 40; CV, 39 & 70; CVII, 67; the phrase "cum suis hominibus/fidelibus" is common). The immensity of Leo IV's project at the Vatican is reflected by the huge workforce raised from "singulis civitatibus massisque universis publicis ac monasteriis"; two inscriptions record the contributions of the domuscultae Saltasina and Capracorum (LP ed. Duchesne I, 518, n. 52; II, 137, n. 47). Saracen slaves were also pressed into service on the walls, as they had been on "diversa artificum opera" following their capture, recalling the forced-labour sentences of the Christian persecutions (LP CV, 54; M. De Rossi, 1864-77, 14-5). Indeed, it is possible that malefactors had continued to be punished in such a way throughout the early middle ages, given the rules laid down in the law codes (CTh II, 14, 1 - 400 AD; V, 7, 2 - 408 AD; XV, 8, 2 - 428 AD; all relate to work in mines and quarries).

One specific by-product of the corvee system, I would suggest, was the characteristic undulating brickwork which we see throughout the buildings of the late eighth and ninth centuries (2.5, above, and chapter 5). In chapter 2 it was proposed that there was a
sudden move to exploit spolia brick from public buildings in the mid eighth century, following 100 years' reliance on more disparate materials. At the same time, we now observe an accelerated phase of new building utilising a mostly unskilled workforce composed of citizens, farmworkers and foreign prisoners. In such circumstances a radical decline in craftsmanship is only to be expected, and mirrors a similar fall in the quality of more rarefied arts such as mosaicwork (in this case due to small workshops taking on too many commissions - Davis-Weyer, 1994, 964). Indeed, this decline of a craft once practised with so much precision during Imperial times into the hands of unskilled labourers would mirror the slide of the architect's profession into the hands of the site foreman, posited above in 3.1.1. 7

The familiar problem of the lack of sources for the tenth century prevents an investigation of the continuation of the corvee after Nicholas I's rebuilding of Gregoriopolis. The only recorded large-scale public works of the period were John VIII's Iohannapolis and Sergius III's reconstruction of S. Giovanni in Laterano, both of which might be expected to have followed the work-practices described above (ICUR II, 326; LP CXVI & 4.2.4, below). Regarding at least the transport of timbers for such works, however, it seems that the boatmen were paid for their work, rather than compelled to continue the angaria of Gregory I's time (Mallius in VZ III, 426; Toubert claims that the document, also included in fragmentary form in the Liber Censuum, may have an early medieval origin - 1973, 642). The private foundations of the tenth century would not, of course, have relied on forced labour. If Gregorovius is right in ascribing continuing public labour services to the Ottonians, it seems that there was no public work to be done in Rome (1.1, n. 11, above).

7 In a wider, metaphorical sense, De Angelis D'Ossat draws a parallel between the decline in building craftsmanship and the loss of refinement in the Latin language of the middle ages (662, 1982).
PART TWO - TYPOLOGY OF CONSTRUCTION

Ecclesiastical, civil and domestic architecture

Chapter 4: Ecclesiastical Architecture

A discussion of church architecture in early medieval Rome would be superfluous unless a different perspective from that of Krautheimer could be proposed. The whole subject is circumscribed by his concept of the Carolingian Renaissance, by his investigations in the Corpus Basilicarum, and the conclusions drawn in "Rome, Profile of a City". Study since Krautheimer has chiefly been concerned with amplifying questions already considered in these works. Thus we now have reasonably detailed and dated sequences for church masonry styles and marble furnishings. Investigation of fresco cycles has proceeded, usually using information from the Corpus to provide dating benchmarks. Some new finds have been made in churches already considered by Krautheimer, often confirming his suppositions with archaeological evidence. Textual study has clarified a dating problem at the S. Apollinaris mentioned in the Liber Pontificalis and S. Lorenzo in Panisperna. There have only been very slight suggestions of disagreement on the dating of important churches - S. Giorgio in Velabro and S. Saba.

Here I intend to consider the evidence for church architecture in two periods which have been almost entirely ignored in all previous studies, including those of Krautheimer himself.

1 Church masonry: Bertelli et al & Avagnina et al (1976-7), Barclay-Lloyd (1985); marble furnishings: Corpus Scultura Altomedievale; frescoes: Melogrami at S. Crisogono (1991) and Davis-Weyer & Emerick at S. Martino ai Monti (1984) follow Krautheimer's Corpus; new excavations: S. Lorenzo in Damaso (Palmer, 1991), SS. Nereo & Achilleo (Sacchi, 1989 & 1990-1), S. Stefano Rotondo (Brandenberg, 1992), SS. Apostoli (Ferdinandi & Leonardi, 1992), S. Clemente (Guidobaldi et al, 1992), S. Cecilia (Parmegiani, 1990); textual study: Geertman (1975); dating disagreements: S. Giorgio in Velabro (see below, 4.1#4) and S. Saba (most recently Pensabene, 1989). Regarding this latter, I can see no satisfactory case for dating the upper church to the late tenth century.

2 A vast field of ecclesiastical architecture in Rome which has received very little concentrated study and absolutely no synthesis is that of the numerous cemeterial complexes. This would require a thesis in itself,
Krautheimer's view of church architecture in Rome is a cyclical one, bristling with revivals, dark ages and full-blown renaissances. The mid fifth century saw a Sistine Renaissance, the early ninth a Carolingian Renaissance, and the thirteenth a Constantinian or Late Antique Renaissance. In between, there was a Byzantine period, a mysterious dark age of over a century from which no building survives, and, strangest of all, a period from 860 to at least 1084 which is seldom even referred to. In repeating Krautheimer, various commentators have stretched the two dark ages, in turn building up the Carolingian period, to the extent that we are told that in the later eighth century "after a caesura of 200 years, churches were once again sumptiously adorned with mosaics and painting" (Mitchell, 1980, 221), and that, by 1000, "not a single building had been erected at Rome for over 100 years" (Wilcox, 1981, 72).

By concentrating on these two periods I do not intend to overplay the case against the Carolingian Renaissance, nor to deny the most obvious archaeological and historical evidence, which undoubtably points to reduced rates of new building in the two centuries before and after 755 and 860. However, by placing the dark ages in their contexts, and proceeding to consider the literary and archaeological evidence for what actual building work continued at these times, I hope to reduce the rigid artistic and chronological barriers set up over the past seventy years.

4.1 The First Dark Age, 640 - 755 AD

The period before our first dark age, that is 500-640, is not especially rich in new church-building. Between the times of the wide-ranging building works of Symmachus and Honorius I, during the years of the Gothic Wars and Lombard invasions, are attested only

and is not attempted here for the additional reason that almost all examples were constructed prior to 500 AD.
the construction of SS. Apostoli, S. Lorenzo fuori le Mura, and Gregory I's S. Victor monastery, as well as unknown works at S. Nicomedes (SS. Nereo & Achilleo at Domitilla has also been tentatively assigned to this period - CBCR III, 133). Of these, only S. Lorenzo survives in a similar form. As we shall see, this is a total which compares unfavourably with the century following Honorius I, a century which in addition saw great civil projects carried through. The primary reason for the view of our dark age as such, I would suggest, is the unusually vigorous building regime of Honorius I from 625-638 which precedes it, and from which two large basilicas survive today. The amount of church construction in these 13 years overshadows not only our own period, but also the one which preceded it (in all, we know of 5 new-built churches, including one at Tivoli, and several conversions and renovations - LP LXXII).

A further factor which strikes a heavy contrast between, in this case, our dark age and the subsequent Carolingian period is the former's so-called Byzantine character. Much has been written on the historical aspects of the period of the "Greek" popes, on the supposed eastern craftsmen at work in Rome after the Gothic Wars and throughout the seventh century, on the Byzantine church plans of the cemetery basilicas and the use of the Byzantine foot (3.2, above). Conversely, the Carolingian Renaissance apparently saw a revival of traditional "Roman" ideas: the plan of the Constantinian basilica, supposed fourth-century iconography in the mosaics, the re-adoption of monumental inscriptions, and even fourth-century construction techniques (Krautheimer, 1942; Mitchell, 1980). At the same time the movement was "an attempt to revive the city's own glorious past by eliminating the 'foreign' Near Eastern influence in architecture as well as in any other field" (Krautheimer op. cit. 23).

But this is a very simplified and selective view. The problem with assigning every slight trend - or merely some new archaeological or architectural data from a specific church - to a "renaissance" is apparent in Krautheimer's description of Honorius I's S. Pancrazio, which due to possible signs of a rudimentary transept, large size, and the absence of the Byzantine foot "represents a throwback to, or a renascence of, earlier
fourth or fifth-century Christian models in Rome" (CBCR III, 174): the hesitancy over the use of "throwback" or "renascence" at least retains a hint of ambiguity in the face of such exiguous evidence, but is instructive for the unconscious parity it gives the terms. It would be tedious to list all the examples of the supposedly "eliminated" Near Eastern influences which continued in Rome's architecture after the time of Hadrian I, or the "traditional", "Roman" elements which had in fact remained in place throughout the "Byzantine" period³. Indeed, the classification of architectural elements displayed in the buildings of Rome according to these two streams is not helpful, considering their assimilation and fusion over at least 500 years before the start of the Carolingian Renaissance.

A specific problem with the term, apparently recognised by Krautheimer by the time of his "Profile of a City", is that "Carolingian Renaissance" denotes entirely different things in Rome from those north of the Alps (1980, 139ff). In the latter case it designates a wide-ranging cultural re-discovery of Classical learning (much of it directly imported from Rome itself), whereas in Rome, the most it should be taken to mean is the occasional use of a basilica plan based on the three "Constantinian" churches assigned to that emperor in the spurious Donation document⁴ (Krautheimer, 1942, 36). The political motives behind Leo III's and Charlemagne's emphasis on the Roman empire of Constantine are well-known and generally accepted; the (later) architectural manifestation of this interest in a handful of Roman church plans is worthy of note, but no more than that. Krautheimer

³ Traditional elements which run through the "Byzantine" period: basilica plans of Honorius, Domnus, Leo II & Gregory III (see below, 4.1 #2, #4, #8 & #10. A similar objection was raised by A. Ferrua when Krautheimer outlined his concept in a conference in 1947 - RAC 1949, 202); the so-called Italian mosaic school (Nordhagen, 1965); elsewhere, Krautheimer himself insists that Rome remained essentially "western" in outlook (1980, 105). Byzantine elements which run through the "Carolingian" period: all the new buildings of Hadrian I and Leo III (including the works at the Lateran palace); the chapel of Leo IV at S. Clemente (Tronzo, 1987); regarding the apparent return to fourth-century, Roman styles and subjects in mosaics, it should be noted that Manuel Chrysoloras, a Byzantine writing in Rome in 1411, considered that all surviving mosaics in the city "truly pertain to Greece or even to Constantinople" (Mango, 1972, 252). S. Prassede copies the sixth-century mosaic of SS. Cosma & Damiano rather than any earlier model.

⁴ In fact, the only genuine Constantinian church plan adopted in the ninth century at Rome was that of S. Peter's - and even the most similar imitation, S. Prassede, has two, not four aisles. Since Krautheimer's work on this subject, what we might term the "real Constantinian church plan" has emerged: that of the huge cemetery basilicas with their continuous apse-ambulatoria and attached circular mausolea (S. Agnese, S. Lorenzo, S. Sebastiano, SS. Marcellino & Pietro, the "anonymous Via Prenestina", and possibly the new S. Marco on the Via Ardeatina). In no cases was this type revived during the ninth century.
originally used the adjective "Carolingian" as a chronological convenience (op. cit. 3), although it is difficult to disassociate fuller, political implications from the word. Regarding the architectural traces in Rome, perhaps the expression "Constantinian Revival" would be more accurate, even if stated so baldly this too would be susceptible to vast and indiscriminate interpretations.

Before we discuss what was actually built between the pontificates of Honorius I and Hadrian I we should first consider the possible biases in our evidence, textual and archaeological. Our primary, almost sole source for church-building in the period 640-772 is of course the Liber Pontificalis. It certainly records a reduced number of newly-constructed edifices in our period, especially when considered in comparison with the amount of building in the period 772-860. Delogu takes this imbalance at face value, considering that the entire text "provides a continuous and homogeneous series of facts about certain papal activities" (1988a, 32). Davis, however, sees the composition of the biographies as far from homogeneous. Commenting on the life of Stephen II he notes that "the author saw no need to fall back on church restorations to fill out his text, though a few were added by a later reviser" (LP ed. 1992, 51). The biography of Gregory II exists in two versions, an "original" and a later adaption which "redresses the lack of church repairs and endowments" (op. cit. 1). This idea that the lists of buildings and donations in the Liber Pontificalis are somehow "filling" is also proposed by Geertman. Remarking on the vast documentation of donations and restorations to churches in the lives of Hadrian I and Leo III and their comparative lack of history (after the first part of the former), he theorises that a conscious effort was being made here to excise subjects which might upset the popes' political machinations with the Franks, especially considering the popularity of the

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5 The current monolithic idea of the Carolingian Renaissance as an all-embracing cultural entity means that many architectural and artistic devices visible in the churches of the ninth century in Rome are automatically assigned to the "renovatio" even though they are often to be found running right through the dark age. Pain, for example, claims a Carolingian reappearance of the tabula ansata in the inscriptions of ninth-century Rome (1986); the motif, however, never disappeared, and runs right through our dark age in the brickstamps of John VII (see 2.5) and the epitaph of Paul I (Grimaldi, 1972, 372). Regarding inscriptions generally, Gray would place the revival of Classicism and "something unquestionably humanistic" in the late ninth and tenth centuries in Rome (1948, 139). Giovenale, speaking of sculpture in the period (1925, 99-101), sees the Carolingian years as an era of barbarism which itself divides two classical periods!
Liber Pontificalis north of the Alps (1975, 2, n.3). By the same token, politics and theology would have been uppermost in the writers' minds during the late seventh and early eighth centuries, now seen as a period when the papacy was consciously striving to achieve independence from Byzantium (Noble, 1984).

There is, moreover, certain evidence for building works executed by the popes themselves during our first dark age which were not recorded in the Liber Pontificalis. There is no textual record of the decoration and probable conversion of SS. Martina & Lucca by Domnus, known from a description of the destroyed apse mosaic (Franchi de'Cavalieri, 1903, 222). Excavations at the Tre Fontane in 1867 discovered the remains of the 3-oratory memorial to St. Paul described by Panvinio in 1570 (BAC 1869, 83-92); an inscription was found indicating that the shrine was the work of Sergius I, carried out in 689. A document of 1005 states that the monasteries at Subiaco were re-founded and rebuilt at the instigation of John VII (Kehr, 1961, 91); again, neither work is recorded in the two popes' biographies. Bearing in mind such a textual imbalance between our dark age and the period from Hadrian I, it is interesting to compare the summary note in Gregory II's biography - "he renewed various churches which were collapsing, which would take too long to list" (XCI, 2) - with the exhaustive building-by-building account (which indeed could be said to take too long) given for Hadrian himself. One of Gregory's projects passed over by the Liber Pontificalis would be the re-founding of Monte Cassino, which Paul the Deacon states that he instigated (VI, 40). Legend, as well as more substantial sculptural evidence, assigns the conversion and dedication of S. Maria della Rotonda in Albano Laziale to pope Stephen III in 768 (Martorelli, 1988). Lastly, as we saw in 1.3, the Liber Pontificalis stops recording private foundations after the pontificate of Symmachus; the most notable of these omissions in our dark age would therefore be S. Maria in Sassia, S. Gregorio Nazianzeno and S. Angelo in Pescheria (#7, #11 & #12, below). Indeed, this whole question - the reasons for the building lists' inclusion, their manner of compilation and the varying proportions worked into the biographies - has not yet received any concerted study. Suffice here merely to draw attention to the uneven nature of their appearance in the Liber Pontificalis, and the biased picture they could present of
church-building in our first dark age.

The bias in our archaeological record of churches in this period - that is, whether or not they survive, and, if not, whether anything is known of their physical form - is a question we shall consider as we present the individual cases. Briefly it should be pointed out that of the fifteen churches built new in Rome in the period 772-860, twelve survive in more-or-less similar form; of the fifteen built between 640 and 772, as we shall see, only two or perhaps three could be said to survive in an at most rudimentary form.

#1 S. Euplos, c. 642-9 (fig. 1.1)

First mentioned in the Liber Pontificalis: "Theodore fecit et oratorium beato Euplo martyris foris porta beati Pauli apostoli quem etiam ornavit" (LXXXV, 5). When Hadrian I restored the portico running to S. Paolo fuori le Mura he included work on S. Euplos "una cum ecclesia sancti Eupli" (XCVII, 74). It is next mentioned in a property document from S. Alessio in 1145 as a border of a rented plot: "a primo latere est murus civitatis et meta, a secundo latere est via publica et ecclesia sancti Eupli" (Monaci, 1904, 384). Its position has therefore been placed precisely at the entrance to the portico, almost contiguous with the Porta Ostiensis (Armellini, 1942, 1147). Most commentators identify it with the late medieval S. Salvatore de Porta here, destroyed in 1849, and thus Lanciani has presented it in FUR pl. 44 (the hospital of S. Euplos, known from the thirteenth century, he places opposite and closer to the gate). Achille Pinelli's 1834 watercolour of S. Salvatore shows that the very narrow facade was given a late Renaissance aspect at some stage; to either side of the single central door can be seen what are probably late medieval

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6 772-860: S. Maria in Cosmedin, S. Peregrino, SS. Nereo & Achilleo, S. Susanna, S. Stefano degli Abissini, S. Prassede, S. Cecilia, S. Maria in Domnica, S. Marco, S. Martino ai Monti, S. Maria Nova, SS. Quattro Coronati, SS. Sergius & Bacchus, S. Maria in Sassia and S. Romanus; the last three do not survive. 640-772: the thirteen considered below, excluding Paul I's SS. Peter & Paul, plus S. Venanzio, S. Euphemia and S. Silvestro in Capite; only S. Venanzio and S. Gregorio Nazianzeno survive; others survive in fragmentary form (see below).
vestiges, with rooms added above (Bosi, 1976, tav. 27).

Almost nothing is known of the form of Theodore's church (our fig. 1.1 is taken from Lanciani's plan of S. Salvatore). The verb "facere" is impossible to interpret precisely, especially when applied to an "oratorio", as can be seen from the discussion of building expressions in the Liber Pontificalis in Appendix 1, below. S. Euplos may therefore have been a conversion or an entirely new work. However, the possibility that it was no more than a shrine, placed, as some have suggested, within the Porta Ostiensis, should be discarded due to the later references to it as "ecclesia" (Armellini, 1942, 1438). De Rossi still saw the "vestigia" of an oratory (which he identified as S. Salvatore) in 1866; they were situated in the vigna Paracciani, on the right after the gate (BAC 1866, 33). Recovered from the same site were a marble sarcophagus whose shield reliefs would place it in the fifth century and a fragment of an epitaph to a Constantius or Constantina whose palaeography betokened the fourth or fifth centuries. Found in the same vineyard was the late medieval inscription from S. Salvatore which referred to "altari superiori" (Forcella XII #457). This suggested to De Rossi that by the late middle ages there was also an "altare sotteraneo", that is, in the original oratory, by this stage used as a crypt. We might therefore imagine three phases at the site. An early Christian burial, presumably in a small mausoleum, followed by the "ecclesia" of Theodore (later the altare sotteraneo), and finally the church of S. Salvatore. Theodore's church could then have simply represented the conversion of a mausoleum, perhaps a similar edifice to S. Passera on the Via Portuensis. Again, it might have been built as new, above the burial chamber containing the sarcophagus; in this case the latter would represent the "altare sotteraneo" and S. Euplos would have become S. Salvatore with a simple change of dedication rather than by being replaced with a new building.

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7 Armellini and Huelsen give no evidence for their belief that S. Euplos and S. Salvatore were entirely different churches (1942, 1147; 1927, 250); Panciroli and Martinello give an ancient tradition which saw S. Salvatore as the (miraculous) conversion of a Roman house of Plautilla, who offered her veil to St. Paul as a blindfold at his execution (1600, 750; 1653, 301). More substantial evidence for continuity between S. Euplos and S. Salvatore comes from the fact that the inscription from the latter is a re-used fragment of liturgical furniture which bears an interface pattern on the side typical of eighth-century work; it could therefore have belonged to the restoration of S. Euplos by Hadrian I.
Considering that not even the plan of Theodore's church can be ascertained, any attempt to reconstruct its appearance should be impossible. However, bearing in mind our provisional conclusion that it either had the form of a converted mausoleum, or else was a small edifice presaging Pinelli's illustration of S. Salvatore, we may be safe in using the surviving chapel of S. Venanzio, adjoining the Lateran Baptistery, as a parallel (fig. 1.2). This was started by Theodore's predecessor John IV, whose work is described by the Liber Pontificalis in almost the same terms as Theodore's at S. Euplos: "fecit ecclesiæ...quam ornavit" (LXXIV, 2). Theodore finished the project, and may even be depicted as the last figure to the right in the apse mosaic (Armellini op. cit. 136). Most scholars view S. Venanzio as a converted portico (Duchesne, LP I, 330, n. 3). As it stands today the chapel displays walls mostly refaced in modern brick, but the delineation of a two-arched arcade can be made out in the left wall; it has been blocked in with a masonry of somewhat irregular opus vittatum (2 or 3 courses of bright red tufelli to one of brick) reminiscent of the slightly earlier buildings of Pelagius II and Honorius I. The same masonry is visible in the end of the right wall closest to the entrance. Mosaic decoration and marble revetment cover the entire apse and end wall, which also contains two elaborate marble window frames. All other surfaces of original masonry - the blocked arcade and some of the undersides of the window-arches - are covered in plaster and very faded frescoes. Known hereafter as the "basilica Theodori papae", S. Venanzio represents our only surviving model for the vanished S. Euplos (Martinello, 1653, 316).

The disappearance of S. Euplos from the texts between Hadrian's restoration and its mention in 1145 is strange - it is not listed, for example, in Leo III's donation list in the Liber Pontificalis (XC VIII, 69-81). Considering the unlikelihood of its becoming derelict in only twenty years, we should assume that it was tied to another church: it had various connections with S. Saba, S. Maria in Cosmedin and S. Alessio, as we learn from documents in the latter's archive (Monaci, 1904, 372, 378ff; 1905, 168; cf. also the inscriptions of Eustathius and David, 1.3 above, and the inscription from S. Euplos now in S. Saba, n. 7, above).
First mentioned in the Liber Pontificalis as rebuilt by Deodatus: "Hic ecclesiam beati Petri qui est via Portuense, iuxta ponte Meruli, ut decuit restauravit atque dedicavit" (LXXIX, 4). We hear of it no more until 1034, when a document from S. Maria in Via Lata mentions an "ecclesia destructa" in a property at the site (Tomassetti, 1979, VI, 400). The ruins were seen by Flavius Biondus in the mid fifteenth century (VZ IV, 268). Various topographical research has identified Deodatus' church with a building discovered during the construction of the Rome-Civitavecchia railway in the mid nineteenth century and described briefly before its destruction by Pellegrini (1860). The church, compared by the excavator to S. Stefano on the Via Latina, had a basilica form measuring in total 25m by 14m (fig. 1.3). The walls stood to a height of more than 1m, but we are not told anything of their materials except that they were "pessime costruzioni" (op. cit. 19). The colonnades were formed of spolia columns of pavonazzetto and cipollino of varying dimensions. Some fragments of capitals were found, but no trace of architraves; we might therefore imagine the aisles were arcaded. The pavement of the aisles was formed of fragments of marble slabs; the nave was of opus alexandrinum. The church had been decorated with mosaic and painted intonaco.

How much of these remains were the work of Deodatus is difficult to say. "Rerestauravit" in the Liber Pontificalis is a particularly ambiguous term, especially in the seventh century when it usually appears with no qualifying phrase (substantial interventions use the expression "renovavit atque restauravit a fundamentis" - see Appendix 1). However, the fact that Deodatus also dedicated the church at the end of the work suggests that it had been out of use for some time and therefore that his intervention amounted to a complete rebuilding (Pellegrini suggests it may have been destroyed during the Gothic sieges - op. cit. 4). The plan, foundations, columns and capitals could all have been reused from the (undated) earlier phase; the surviving traces of decoration (intonaco and fresco, mosaic,
paving and opus sectile) should all be attributed to Deodatus. It is unfortunate that the 1m of standing wall were not described; if they were really "pessime costruzioni" an attribution to Deodatus rather than to the early Christian period would be more likely.

#3 SS. Peter and Paul - Via Ostiensis, c. 676-8

First mentioned in the Liber Pontificalis as rebuilt by Domnus, in exactly the same terms as Deodatus' S. Peter: "ecclesiam Apostolorum sita via Ostense ut decuit restauravit atque dedicavit" (LXXX, 1). In the mid eighth century Zacharias donated "pendentia vela inter columnas...in ecclesia sanctorum principium apostolorum Petri et Pauli" (XCIII, 19). The use of the singular "ecclesia" led Duchesne to suggest that this might refer to Domnus' church, although he preferred the theory that it represented a copy-error for "ecclesiae", thus signifying gifts to both S. Peter's and to S. Paolo fuori le Mura (it could also refer to S. Sebastiano, the "apostles' church"). A small chapel dedicated to S. Crocefisso, half a mile from the Porta Ostiensis on the Via Ostiensis, destroyed in the early years of this century, is usually identified with Domnus' church (Armellini, 1942, 1148). Because it seems that it was rebuilt (on the opposite side of the road) in 1562 or 1568, the various representations of the Crucifix chapel on plans from around 1600 can give no help regarding its original appearance (Tommassetti, 1979, V, 86). If the Zacharias reference is accepted we should at least imagine an aisled basilica with columns.

#4 S. Giorgio in Velabro, c. 682-3 (fig. 1.4)

The precise origin of this well-known church in the pontificate of Leo II depends primarily on a tenth-century interpolation in his Liber Pontificalis biography: "huius...iussu aecclesia iuxta velum auream in honore beati Sebastiani edificata est, necnon in honore
martyris Georgii" (LXXXII). Certainly the church existed before the time of Zacharias (741-52), who deposited the head of St. George there (XCIII, 24); nor are there any secure references to it before Leo II. In the Liber Pontificalis the verb "aedificare" denotes new building work (see Appendix I). The use of "iusu" might imply that Leo's role was to grant the permit for construction, that is, of a privately-funded work (this would explain the exclusion of the foundation in most editions of the Liber Pontificalis). More evidence to assign the building of S. Giorgio to the time of Leo II is found through its double dedication to St. Sebastian. In 680, as an offering of thanks for the relief of Rome from the plague, an altar to St. Sebastian was built at S. Pietro in Vincoli; the subsequent dedication of a church-diaconia to Saints George and Sebastian would therefore fall into a similar historical context (Munoz, 1926, 44). Thus the foundation of S. Giorgio in Velabro in the pontificate of Leo II can be accepted; the controversial question regards how much of the surviving structure is his work.

The church was substantially rebuilt by Gregory IV in the mid ninth century: "fecit autem in ecclesia beati Christi martyris Georgii...hinc inde porticos, quos etiam ad decor-em ipsius basilicae variis ornavit picturis. Absidam...a fundamentis...compsit" (LP CHI, 14). There seems no doubt that here a reconstruction of the aisles and apse is intended; there would be no reason to be so specific if the entire basilica was completely rebuilt. Krautheimer observed the familiar undulating spolia brickwork at the following points: in the front, back and side walls of the exterior of the left aisle; throughout the apse and gable; and in parts of the side and front walls of the exterior of the right aisle (CBCR I, 252-3). After the bomb damage of June 1993 I was able to see the same brickwork behind the fresco of a saint on the inside of the left aisle, inside the campanile. In addition, the apse exterior displays the familiar ninth-century re-use of foliate corbels (2.3.2, above). So far the Liber Pontificalis description is confirmed by the surviving evidence: that is, we can detect ninth-century work throughout the aisles and apse, as well as contemporary fresco-

8 Munoz fails to name his source, although it must be Paul the Deacon (VI, 5); the text, however, would appear to refer to Pavia, not Rome. But we do know that Rome suffered from the plague at the time (LP LXXXI, 16); and Munoz refers to a surviving mosaic portrait of St. Sebastian in Rome's S. Pietro in Vincoli.
painting.

It is possible to apprehend the existence of a slightly smaller, aisled basilica from Munoz' plan of structures found below the present pavement during the restoration of 1926; the multiplicity of such wall-footings, however, coupled with the lack of any good stratigraphic information, means that the reconstruction tends to be somewhat subjective (1926, fig. 6; our fig. 1.4; cf. the interpretation in CBCR I, fig. 147). The left aisle here follows a course just within the present front corner. An earlier apse starts its curve from the last column of the left arcade, that is, about 3m inside the ninth-century construction. The left colonnade would appear to be precisely the one surviving in the present church, except for the last arch which now swings awkwardly to the right in order to join the ninth-century apse. The footing for the original right colonnade may be that running just inside the ninth-century one; the original right aisle wall would then be identified with the foundation running about 3m inside that of the present church (alternatively, these footings may pre-date even Leo's church; in which case both colonnades could be original - see note 9). It is thus possible to visualise Leo's church as having substantially the same plan as Gregory IV's, but being about 3m shorter and narrower. The masonry of the existing left arcade, left clerestory and facade, which according to this theory would represent the fabric of the earlier church, has not been visible since the 1926 restoration.

Further physical evidence for Leo's church exists in its marble sculpture. Two pieces of plutei were found in Munoz' works which show relief motifs of "cancelli" and shields which are certainly prior to the eighth and ninth century (Giannettini & Venanzi, 1967, figs. 30-1). And the roughest of the ionic capitals visible in the existing arcades should also be assigned to a period after the sixth and before the ninth centuries (op. cit. fig. 20).

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9 Krautheimer, who believes there is no physical evidence for a church prior to that of Gregory IV, is the only commentator to note the characteristic ninth-century undulating brickwork in the left clerestory (CBCR I, 253). But he gives no illustration, nor does he specify at which point this was visible; it is not possible to say whether he found such evidence in a photograph or observed it in situ. Giannettini & Venanzi, on the other hand, believe that both colonnades and clerestories are Leo II's work; they claim to recognise possible seventh-century brickwork around one of the square windows in the right clerestory (1967, 53, followed by Bertelli et al, 1976-7, 125).
From the present evidence, then, it seems that we can reconstruct a church of S. Giorgio in Velabro dating from the pontificate of Leo II which had the form of a 3-naved basilica, of slightly smaller size to that rebuilt by Gregory IV in the ninth century, and perhaps utilising some pre-existing Roman structures. At least one of its colonnades survives today, displaying one of the most heterogeneous collections of spolia of the entire period. The comparatively large size of this seventh-century church is further reflected by the fact that the Liber Pontificalis describes it as having an "altare maiore" (in Leo III's biography - XCVIII, 104).

#5 SS. Simplicius Faustinus & Beatrice, c. 682-3 (fig. 1.5)

Founded by Leo II, as we learn from the Liber Pontificalis: "Hic fecit ecclesiam in urbe Roma iuxta sancta Viviana ubi et corpora sanctorum Simplici, Faustini, Beatricis atque aliorum martyrum recondidit at ad nomen beati Pauli apostoli dedicavit" (LXXXII, 5). It is clear that this was a different building from S. Bibiana, but due to the Liber Pontificalis wording we cannot know whether it was newly-constructed or simply a conversion of a pre-existing structure. Krautheimer recently suggested that the original S. Bibiana itself was a converted trefoil mausoleum, perhaps the actual tomb of Bibiana herself (1994, 15); if so, it would not be surprising to find other funereal buildings nearby. By the time of Leo III's donation list (807) there was a convent at S. Bibiana which seems to have taken over Leo II's church also, thus explaining the lack of references to the latter in documents thereafter (Davis in LP XCVIII, 78). The building itself survived, at least in ruins, until the seventeenth century when Bosio copied Leo II's inscription: "si vedono vicino della chiesa di S. Bibiana, e quasi contiguo a quella, le rovine d'un altra chiesa; nelle cui parietine rimane tuttavia quest'iscrizione nell'istesso muro" (1632, 585). These "contiguous ruins" may be identified with any of the rather indeterminate structures shown on Bufalini's map of 1551, which shows S. Bibiana positioned within a large rectangular
A rather vague reference in Lanciani's "Storia degli Scavi" may give a clue to the destruction of Leo's church. In 1562, during the building of Pius IV's casino in the Vatican gardens, one M. Antonio da S. Vito was paid 200 scudi "a buon conto di fabbriche et della cavatura delle colonne...di Sta Biviana" (1989-92 III, 248). Considering that S. Bibiana itself was still a functioning, consecrated church (and that its eight ancient columns survived Bernini's rebuilding in 1625), we should imagine that the spoliation of columns and the "cavatura" took place in Leo's church, reducing it to the ruinous state described by Bosio. The presence of an inscription from S. Simplicius in the floor of the pre-Bernini S. Bibiana, seen by Martinello, would be further evidence for its spoliation at this time (1653, 82).

#6 S. Andrea - Via Labicana, c. 687-701 (fig. 2.1)

Rebuilt by Sergius I, according to the Liber Pontificalis: "Hic oratorium sancti Andreae apostoli, qui ponitur Lavicana, a solo refecit" (LXXXVI, 13). We have here a clear reference to substantial construction work (see Appendix 1). The great problem is to identify the church. Duchesne connected it with one of a group of churches dedicated by Gelasius I (492-6) at a Villa Pertusa on the Via Labicana: "dedicavit...alias basilicas sanctorum Nicandri, Eleutheri et Andreae in via Lavicana, in villa Pertusa" (LP LI, 5). This estate is believed to have occupied territory somewhere between the sixth and tenth miles (Tomassetti, 1979, III, 485). The basilicas have never been found.

To move into the realm of pure hypothesis now, I would tentatively propose an identification of the complex at the so-called S. Maura, just beyond the fifth mile of the
modern Via Casilina. This ruin consists of a wall containing a large apse and two more fragmentary walls running off at right-angles to each side of the apse. In the nineteenth century it still preserved its form as a three-aisled basilica, 18m wide and 15m long (Quilici, 1974, 746; our fig. 2.1). It takes its name from a groundless conjecture of Ashby, who decided that the (probably modern) name "cappella di S. Maura", which he had seen given to a nearby brick mausoleum on a modern map, would better suit the apsed ruin (1902, 231).

The reasons for proposing it as one of the churches of Gelasius, and perhaps Sergius' S. Andrea are: 1) It is in more-or-less the correct spot for the Villa Pertusa estate on the Via Labicana (which ran slightly to the south of the Via Casilina). 2) Excavations in the 1960s revealed it as one apsed building of a small group of structures, with another apse immediately to the east - and Gelasius' site was a complex of churches (Quilici, ibid.) The original location on a villa site could have echoes in the adjacent "remains of other buildings in brickwork of a late period" seen by Ashby and a concrete cistern noted by Tomassetti (Ashby op. cit.; Tomassetti, 1979, III, 481). 3) The origin of at least some of the structures as Roman mausolea finds an echo in Gelasius' other dedication in the campagna, that of S. Maria on the Via Laurentina, identified as the surviving converted mausoleum of S. Maria delle Vigne in Pratica di Mare by S. Patitucci (1969, 175-191; Quilici suggests S. Maura could have been a "civil basilica" - ibid.). 4) Lastly, the surviving masonry of S. Maura is of opus vittatum, displaying a disordered combination of spolia materials which presages the building techniques of the later eighth century.

This suggestion, of course, remains to be proved, either by further excavation or some topographical evidence which would tie the precise site of the Villa Pertusa to that of S. Maura. The fact that of Gelasius' group of basilicas Sergius restored a mere "oratorium", and that our S. Maura is quite a large building could militate against our identification, although as we have pointed out, "oratorium" is not usually used specifically in the Liber Pontificalis (as when S. Euplos is referred to as both an oratory and a church, above). There seem to be no mentions of S. Andrea after Sergius I; Tomassetti believed a
reference to a "S. Andrea iuxta via Lavicanensis" in a document of 1065 was an error for "Via Latina", although he gave no good reason (1979, IV, 430).

#7 S. Maria in Sassia, c. 727

According to the English sources, founded during Ina's stay in Rome under the pontificate of Gregory II. Regarding Ina, Matthew of Paris writes: "Fecit, iuxta domum prefatam, ecclesiam in honorem beatae Virginis Mariae fabricari, in qua Anglis Romam adventibus celebrarentur officia" (quoted in Fabre, 1892, 160; Gregorovius II, 427 gives the alternative version of the so-called Matthew of Westminster: "fecit - ecclesiam in hon. b. virg. Mariae"). The Liber Pontificalis first mentions the church after the fire which devastated the Borgo during Leo IV's pontificate; it was rebuilt "a fundamentis" by Leo and furnished with textiles (CV, 86). There is no reason to doubt the early dating of the original construction: it is normal practice for the Liber Pontificalis to omit buildings funded from non-papal sources (see above, 1.3).

The present building on the site is the work of Antonio da Sangallo. Considering that there has never been any excavation here a reconstruction of the early medieval church seems impossible. The "vedute" prior to the late sixteenth century should, however, reflect the form of the ninth-century phase. The clearest drawing, of A. Strozzi, shows it to have been entirely unlike any other of Leo IV's church buildings (Frutaz, 1962, tav. 159). S. Maria here is shown as a simple two-cell structure, formed of a single nave and a chancel, the latter apparently the larger part. From such slender evidence it is probably too much to draw parallels with known early medieval Saxon churches in England which display box-like plans of nave and chancel, such as S. Lawrence at Bradford-on-Avon, Our Lady at Seaton Delaval or S. Andrew at Greensted. However, the decidedly un-Roman form of Strozzi's drawing must surely owe something to the pre-Leonine building of Ina.
First mentioned in the Liber Pontificalis when rebuilt by Gregory III: "basilicam sanctae Dei generis quae appellatur Acyro, in qua antea diaconia et parvum oratorium fuit, eam a fundamentis longiorum at latiorum construxit atque depinxit" (XCII, 12). It is with Gregory III that the building references in the text start to take on the precision and detail which will later displace the historical narrative at the end of the eighth century. "Construxit a fundamentis" in the Liber Pontificalis is the strongest denotation of substantial building activity which can be confirmed from archaeological evidence (see Appendix 1). Thus we should interpret Gregory III's intervention at S. Maria as new building work: the reconstruction of a small oratory "from the foundations" as a new, much larger basilica (the founding of the original S. Maria, not recorded in the Liber Pontificalis or anywhere else, was probably made by a private individual whose name, Cyrus, was preserved in its appellation).

The present building on the site was erected by Francisco da Volterra in 1590. Any attempt to reconstruct Gregory's church is complicated by Krautheimer's theory that there was an intermediate rebuilding during the late middle ages which amounted to the construction of a new church (CBCR III, 275-6). This is based simply upon the fact that in 1179 and 1295 two "altaris minoris" were dedicated, and relics deposited under them, as we learn from inscriptions copied from manuscripts by Martinello in 1653. Krautheimer assumed that these would have stood in apses at the end of each aisle, but both Buffalini and DuPerac show the pre-1590 church as a simple 3-aisled basilica with only one, central apse (Frutaz 1962, tav. 202; 248ff). Nor is there any evidence whatever for any substantial rebuilding between the eighth and sixteenth centuries. The two inscriptions make no such claims; Krautheimer fails to suggest to which of the altar dedications we should assign the supposed reconstruction, but assuming that it were the first, we would imagine a 100 year gap before the second apse was dedicated - and absolutely no record of a consecration of

10 Alternatively, Ugo Falesiedi has suggested a derivation from Abbacynis, a saint often associated with charitable foundations (pc).
the main altar.

One piece of evidence does point to some building work in the late middle ages, however - but at the same time suggests how limited this was. In 1866, during Pius IX's restoration work, the floor of the 1590 church was replaced and an earlier pavement was discovered 40cm beneath (Imperi, 1866, 36). This was quite clearly described as being of two types: the major part was "a disegno bizantino, composto...di pietruzze di marmo bianco e giallo, e di porfido e serpentino a rettangoli di volgari lineamente e di cattivo lavoro"; there was also "qualche frammento meglio conservato, ed eseguito con miglior gusto", which was preserved in the sacristy and at the altar "per memoria dell'antico" (Imperi, ibid.). Still surviving within the pavement of the tribune is a panel of this latter type - cosmatesque work in porphyry and marble. We might imagine this (there is no more visible anywhere in the church) as a testimony of the twelfth or thirteenth-century phase, perhaps a renewal of the pavement around the altars referred to above; unfortunately Imperi does not mention where these specific fragments were found. The rest of the work "di cattivo lavoro" would then be the original floor of Gregory's church, which occupied the whole of the 1590 groundspace with the exception of the tribune, transept and lateral chapels (and not, as Krautheimer states, simply the present nave; Imperi op. cit. 51). It was described by Ugonio as consisting of nave and side aisles, divided by 16 columns, and preceded by a narthex (which lay directly under the sixteenth-century vestibule according to Imperi, ibid.). The fact that the apse is said to be a few steps up from the nave may be further evidence that the late medieval work was concentrated only here and included the laying of cosmatesque flooring in this area (Ugonio's manuscript, quoted in CBCR III, 275; our fig. 2.2).

Some very interesting remains of structures pre-dating Gregory's church came to light in 1992, when Ugo Falesiedi discovered various structures beneath the pavement of the tribune (that is, just behind Gregory's apse if we are to judge from Imperi's description). At a level of 3m beneath the floor, ancient chambers had been re-utilised as

11 I would like to express my thanks to Fratel Falesiedi for discussing his work with me and showing me
nineteenth-century tombs. The best-studied of these was a 6m by 6m cross-vaulted hall of opus vittatum lying almost directly under the baroque cupola. The original floor level of the chamber would have been considerably lower than the floor level of the tombs, which was just below the chamber's vault springing (the tombs themselves were not excavated by Falesiedi). The south wall of the chamber was later than the walls of opus vittatum, and was constructed of regularly-laid but heterogeneous spolia bricks; it was pierced by three arrow-slits. The other three walls contained windows, and the east wall a small apsed niche. The nineteenth-century tombs extend to each side of this chamber, and Falesiedi hopes to extend his investigations into the surrounding area later this year (1995). All we can say at this point is that the cross-vaulted structure is much earlier than Gregory's church, since it lies at a far deeper level. The regular opus vittatum is of a type familiar from various late fourth and fifth-century structures such as S. Lorenzo in Lucina and S. Maria Maggiore. The later brick wall does not display the characteristic undulating coursing of the late eighth and ninth centuries, and so could be the work of the late fifth or sixth centuries, or even of Gregory III. It is not beyond the realm of possibility that the structure represents a part of the preceding diaconia, or even the "parvum oratorium" itself; further investigation and excavation should clarify this.

#9 SS. Sergius & Bacchus, c. 731-41 (fig. 2.3)

Another diaconia enlargement of Gregory III: "diaconiam sanctorum Sergii et Bachi sitam ad beatam Petram apostolum, in qua pridem parvum oratorium erat, a fundamentis ampliori fabrica dilatavit" (LP XCII, 13). This would seem to have been a similar but less substantial project to the above. The only other possible textual reference to the foundation is in the twelfth-century list of Cencius Camerarius where a S. Sergius palatii Caruli, also at the Vatican, is mentioned; this led Duchesne to the ingenious suggestion its very clear documentation; the findings are to form a chapter of his forthcoming "Le Diaconie. I Servizi Assistenziali nella Chiesa Antica" (Sussidi Patristi 8, Rome 1995).
that the diaconia was converted into the palace used by the ninth-century "missus imperatoris", but that the actual oratory was preserved along with (half of) its appellation (ed. LP II, 43, n. 79). The precise location of the diaconia was marked by Alpharani in his plan of old S. Peter's as "I", at the eastern corner of the north transept; however, he gives no evidence for such a clear identification (1914, 50 & plan; our fig. 2.3). Severano follows this identification, but it is not clear whether he had actually seen any remains of either SS. Sergius & Bacchus or its twin on the plan, SS. Johannes & Paulus ("due grandi chiese antiche"; he adds that nearby were found "ancora molti e grandi vestigij di altre fabbriche antiche", which suggests that the description is based on archaeological evidence - 1630, 77).

#10 SS. Marcellino & Pietro, c.731-41 (fig. 2.4)

The church in Via Memlana as opposed to the cemetery basilica on the Via Labicana. It was rebuilt by Gregory III: "Fecit vero a novo ecclesiam sanctorum Marcellini et Petri iuxta Lateranis" (LP XCII, 13). Testimony to the original church comes, firstly, from excavations made during the construction of the entirely new church under Benedict XIV in 1751: they discovered a fragmentary inscription of pope Siricius (384-98), suggesting he dedicated a building constructed by a private individual from "sumptu proprio" (Armellini, 1942, 276). Secondly, the church's priest Albinus was present at Gregory I's Rome synod of 595 (Duchesne, LP I, 424, n. 29).

Gregory III's work would seem to represent a substantial rebuilding, to judge from the Liber Pontificalis expression "fecit vero a novo" (see Appendix 1). From the plan made by Bianchini during the church's demolition we can reconstruct a three-aisled, three-apsed structure of irregular, tapering form (the left aisle had collapsed during the later middle ages and the nave was walled-up by cardinal Pierbenedetti in 1589 - Cecchelli & Persico, 1938, 33ff & fig. 2; our fig. 2.4). The attribution of the three-apsed plan to Gregory III is
suggested by the fact that the right apse was dedicated to Gregory I (and so was later than that pope) and re-consecrated by Alexander IV during his restoration in 1256 (and thus earlier than this in origin; Rushforth in fact dates the canonisation to Gregory III's pontificate - 1902, 30, n. 2). The left apse, discovered in ruins in 1751, was dedicated to unknown saints, but had furnishings of clear eighth-century date and a pavement of "opere texallato" (Cecchelli & Persico op. cit. 34; the pluteus was illustrated by Bianchini).

The church was rebuilt again by Alexander IV in 1256 (whose inscription survives in the present building), so the few descriptions and drawings we have from the sixteenth century present the later phase. This, however, seems to have represented a reduction in size of Gregory's church. Ugonio describes the church as having the entrance in the right-hand aisle, a condition illustrated also in Santi's "Cose Maravigliose" (1588, 148; Armellini, 1942, 277). In fact, judging from the Santi drawing, Alexander must have constructed the campanile at the front of the central nave, thus blocking the original entrance; the new door was placed in the middle of the right aisle, with a two-storey insertion (of living-quarters?) made within the front part of this aisle (cf. also Bianchini's plan).

The reduced two-aisle church displayed the following characteristics to Ugonio in 1588, which we should associate with Gregory's rebuilding: a raised tribune with a sunken confessio, masonry benches running around both remaining apses, four columns and a pilaster dividing the nave and aisle, and a pavement originally of "tavole di marmo e di varia intarsiatura lastricato" (1588, 148). Bearing in mind the re-use of large opus quadratum blocks for the foundations of S. Angelo in Pescheria (see below) and later churches, it would be tempting to imagine that Gregory III's church stood on similar structures, described by Vacca around 1700 as a "grosa muraglia fondata sopra quadri di travertino" (Lanciani, 1989-92 II, 113). These were found under and around the church; some were utilised by Sixtus V for various building works (Lanciani, ibid.).

12 Ruins seen by Ugonio (1588, 148), Mellini and Terribilini (mid-seventeenth and eighteenth centuries, quoted from mss in Armellini, 1942, 277) in the adjacent garden were variously identified as a monastery of S. Lucia, as part of an earlier church, and a palace respectively.
Our first certain reference for this church comes in the Liber Pontificalis biography of Leo III, where it is mentioned in the list of donations made in 807: "Fecit in oratorio sancti Gregorii qui ponitur in Campo Martis canistrum ex argento, pens. lib. III" (XCVIII, 80). The somewhat provisional dating of its construction to the pontificate of Zacharias depends on two factors: firstly its masonry techniques, which are typical of well-dated buildings from c. 755-855, and secondly the tradition of the monastery chronicle of S. Maria in Campo Marzio. Here it is recounted that Greek Basilean nuns fled from Constantinople during the iconoclast persecutions of Constantine V and arrived in Rome in 750 with the relics of St. Gregory Nazianzenus and St. Quirinus and a precious icon of the Virgin (which survives in the church of S. Maria in Campo Marzio). Conceded the site of the Temple of Minerva near the Pantheon by Zacharias, they erected an oratory amongst the ruins, shortly afterwards moving a little way north to the present site of S. Maria in Campo Marzio. Here was constructed the church of S. Gregorio, together with adjoining monastery buildings (Martinello, 1653, 188). The problem here, of course, is how much of this tradition to believe, and how old it is. Martinello was quoting from the chronicle of a "Fra Iacinto de Nobili, Romano dell'Ordine de'Predicatori". The date of the latter is unclear, but it seems that Panciroli, writing in 1600, used the same chronicle (1600, 483; he makes no reference to the Minerva, but states that there was a pre-existing oratory of S. Maria at the site where the nuns built S. Gregorio). More recently, doubt has been cast at least on such an early presence in Rome of the relics of St. Gregory (Boccardi Storoni, 1987, 103ff) - but this of course would not mean the nuns' arrival there in the eighth century was a fabrication: the actual site of relics is always disputed. At any rate, St. Gregory's body was believed to be at the monastery at least before 1505, the date of a (lost, but copied) inscription recording its discovery during restoration work at the site (Boccardi Storoni op. cit. 103). The relics were moved to a new chapel at S. Peter's in 1580.

13 I would like to thank Mons. Giorgio Orioli, rector of the church, now chapel of the Camera dei Deputati, for his interest and advice, and for permitting me to visit S. Gregorio.
The surviving church of S. Gregorio was virtually rediscovered during restorations in the 1940s (Montenovesi, 1949 & 1950), but the eighth-century date of its fabric was not recognised until further work forty years later, when it passed into the hands of the Camera dei Deputati and underwent a more thorough restoration; during these later works, much of the early medieval masonry was plastered over (Borsi et al, 1987).

The church is a single-naved, apsed structure 16m long and 7m wide (fig. 2.5). The right-hand wall is built on top of, and extends the length of, a wall formed of irregularly-sized opus quadratum tufa blocks, clearly of Republican date. There is a small door, contemporary with the ancient wall, at the centre. The raising and lengthening of this tufa wall is executed in a mixture of spolia brickwork laid in undulating courses and incorporating many of the Republican tufa blocks, evidently from other parts of the same ancient edifice. The entire left wall and the inside of the facade wall are of this same spolia masonry. The picture is confused by two later phases. Firstly, both side walls have had a series of brick arches and piers built up against them. These are formed of much more regularly-laid and similar-sized brick spolia, with the arches formed of short, homogeneous bricks. The apse is largely constructed with the same masonry. Within these arches, much of the irregular brickwork has been plastered and painted with extremely well-preserved (and restored) frescoes. Lastly, these arches have in turn been cut into, and underpinned, by two very large brick arches, one in each side wall, which extend for two-thirds of the length of the church. The building is roofed with a barrel vault.

The most recent restoration report has dated these phases in the following manner: the remains of opus quadratum in the right wall to the fourth century BC; most of the undulating brickwork and re-used tufa blocks to "the early medieval period", more specifically to the time of Leo III, following the Liber Pontificalis notice; the regular brick arches, the apse, the frescoes and the barrel vault to the eleventh century; and the large twin arches to the eighteenth century (Boccardi Storoni, 1987, 105ff). We are concerned here only with the first two phases, and principally the early medieval one.
Montenovesi proposed an identification of the opus quadratum wall as part of a temple of Mars referred to in this part of the Campus Martius by Ovid (1949, 21; 1950, 219). This was treated with scepticism by Boccardi Storoni (op. cit. 106), but the fact remains that there was clearly some substantial Republican edifice here, utilised by the eighth-century builders of the church. The plan of the below-floor levels shows that the ancient wall formed part of a rectangular structure which would fit well with the form of a temple cella (Borsi, 1984, fig. 72).

Boccardi Storoni identifies only parts of the left wall of the church as early medieval (op. cit. 107). However, on the basis that even in the post-restoration state the typical eighth-century masonry continues all around the nave walls, we should imagine that the present building represents the first church in its complete form (the drawings of the walls before the restoration show that all of the plastered walls are of this same masonry - Montenovesi op. cit.; Borsi, 1984, figs. 73-5). In addition, even the apse, which has been proposed as part of the eleventh-century rebuilding (Boccardi Storoni op. cit. 105), seems to preserve undulating spolia brickwork in the lower left section. Preserved in the right-hand wall, inside the first eleventh-century arch and partly covered with a fresco, is part of one of the eighth-century windows: it is little more than an arrow-slit, and calls to mind Lanciani's discovery of similar examples in the presumed seventh-century habitations inserted in the Atrium Vestae (NS 1883, 485). The two brick "caprices" in the left-hand wall, within the eighth-century brickwork, would appear to be either rising sun or palm motifs (Montenovesi, 1950, fig. p. 221); they are found in the Leonine Walls and the church of the SS. Quattro Coronati (and indeed are common in much earlier Christian structures, although not as clumsily-executed as here). More evidence for the original phase of S. Gregorio has recently come to light in the small square room opening off the eighth-century door in the end of the right-hand wall: a fresco has been moved, revealing a small portion of ancient masonry about 1.5m square which appears to show the same undulating spolia brickwork as the church. The purpose of the room is unclear, but it probably formed a part of the monastery complex of the Greek refugees.
The precise dating of the church then is not obvious. It is certainly earlier than 807, when Leo III made his donation; but the masonry, similar to much of the work in Rome between 755 and 855, would prevent a date very much earlier. Given the certain presence of Greek refugees at the monastery and the historical circumstances of the iconoclastic period it would therefore seem unnecessarily sceptical to doubt the tradition assigning its foundation to the pontificate of Zacharias. Despite an element of "circular reasoning", it would thus also be fair to consider that the physical evidence of S. Gregorio extends the corpus of early medieval masonry techniques in Rome into the celebrated dark age of the late seventh and early eighth centuries.

#12 S. Angelo in Pescheria, 755 (fig. 2.6)

One of the few early medieval churches in Rome whose construction is recorded in a surviving inscription, which states: "temporibus domni / Stephani iunioris papae Theodotus / holim dux nunc primicerius scae sedi / apostolicae et pater uius ben diac a solo / edificavit pro intercessionem animae sua / et remedium omnium peccatorum" (MEC XIV, 3; for the preferred dating from the inscription's indiction reference, see Davis LP, 1992, 52). As is usual in the Liber Pontificalis, this example of private funding is excluded, and the church makes its first appearance in the text as "diaconia beati Archangeli" when it is given vestments and liturgical vessels by Leo III (XCVIII, 45, 75, 88, 108). Today, with the exception of its entrance through the monumental Roman propylaeum of the Porticus Octaviae, the building preserves a nineteenth-century appearance, the result of a thorough rebuilding by Pius IX.

By this date (755) we seem to be emerging from the historical dark age, and the church is discussed in some detail by Krautheimer (CBCR I, 66ff). The only traces of the original phase are detectable behind the late medieval crypt. Here are preserved the
foundations and about 1m of the rising walls of Theodotus' three apses (fig. 2.6). All are constructed of massive opus quadratum blocks (at least twice the size of those at S. Gregorio Nazianzeno), laid with some regularity. As one of the few partially surviving and securely-dated structures of the eighth century S. Angelo serves as a benchmark for the dating of early medieval construction techniques in Rome; for this reason it is exasperating that virtually no masonry in brick or opus vittatum survives. The one exception is a tiny portion visible above the blocks of the right apse (CBCR I, fig. 50): rough spolia brick, laid in irregular courses with sporadic use of tufelli. However, it seems that S. Angelo utilised much more opus quadratum than has previously been imagined: a drawing of the exterior of the left wall made in 1609 has been published since Krautheimer's original survey (Thone, 1960, taf. 15). This shows the left aisle wall running on exactly the same course as the modern one (built in 1869, as we know from Parker photograph #275 of that year), and constructed to half of its height in the same tufa blocks visible today in the apses. Towards the front of this opus quadratum wall, brick patching is visible; the upper half of the entire wall is also of brick. One window is visible in the brick portion, placed more-or-less centrally in the wall's length. The very small brick half arch shown just above the last course of tufa blocks does not seem to be a window; it might well be another "rising sun" symbol, observed in a similar position at S. Gregorio Nazianzeno. The double row of corbels placed in the upper half of the wall would suggest the pre-1609 presence of a pitched timber roof running along this side of the church, perhaps a side portico or narthex.

Another feature of the eighth-century church which we might reconstruct from Thone's drawing is the possible presence of galleried aisles, given the apparent height of this left aisle wall. Panciroli tells us that one of the reasons it was felt necessary to rebuild S. Angelo in 1611 was its extreme darkness - quite understandable if there were no clerestory and only a single high window in the aisle walls (1625, 732). Maggi's 1625 bird's-eye view of Rome would suggest that this rebuilding campaign retained the galleried aisles, but opened extra windows in the outside walls (Frutaz, 1962, tav. 315).
This enigmatic church was apparently built by Paul I: "Hic fecit noviter ecclesi-siam... in Via Sacra iuxta templum Rome in honore sanctorum apostolorum Petri et Pauli" (LP XCV, 6). A reference in the eighth itinerary of the Einsiedeln List (dated by Geertman within the period 818-47 - 1975, 203) is generally believed to indicate the church: "Sancti Cosmae et Damiani Palatius Neronis Aeclesia Sancti Petri Ad Vincula Arcus Titi..." (VZ II, 195). Thereafter it disappears utterly from the sources, only being mentioned in a manuscript of Antonio Bruzzo (died 1692), who states that it was demolished by Paul III (1534-50; Armellini, 1942, 193).

The exact location of the building remains a puzzle, depending partly on the interpretation of the "templum Rome" reference, partly on the information of the Einsiedeln itinerary. Without becoming embroiled in the kind of topographical excursus favoured by scholars earlier this century, it will suffice here to repeat De Rossi's conclusion that the "templum Rome-Romae-Romis-vel Romuli" (depending on the manuscript) of the Liber Pontificalis always refers to the rotunda of SS. Cosma & Damiano (BAC 1867, 67).

If we accept the Einsiedeln reference, Paul's church would therefore be on the side towards the Colosseum, just after the Basilica of Maxentius (the "Palatius Neronis" - Lanciani, 1890, 494). The suggestions given up to now regarding Paul's church are, firstly, that it was inserted inside one of the apses of the Basilica of Maxentius (De Rossi, BAC 1867, 70; apart from the satisfactory location, he gives as further evidence the fact that Christian frescoes were discovered here during demolition work, although this is not elaborated). Secondly, Boni suggested its identification as a "vaulted chapel placed against the external wall of an Imperial excubitorium, on the Via Sacra opposite the Temple of Romulus" (NS 1899, 267). If he meant the small rectangular structure (unidentified, as far

14 Valentini & Zucchetti place a full-stop after "Petri", identifying this as SS. Peter & Paul. It seems just as likely, however, that a vague indication to S. Pietro in Vincoli is intended (as in "that way towards..."), as we should imagine in the same itinerary's direction to S. Teodoro on the right of the path.

15 I have been unable to consult this work, which is not quoted in detail by Armellini nor mentioned anywhere else; whether Bruzio gives any detailed information on the edifice he identifies as SS. Peter and Paul is unclear.
as I know) currently used as a storage space for archaeological material in roughly such a position, I see little either in favour or against such a hypothesis; if we accept the Einsiedeln reference it would be in the wrong place, since it is on the opposite side of the Via Sacra. Lastly, various authors - notably Lanciani (1890, 494) and Prandi (1937, 227) - locate Paul's church on the site occupied now by S. Maria Nova, specifically in the position of the raised transept. Krautheimer finds absolutely no trace of any pre-existing building incorporated within the work of Leo IV, so if we accept the theory we should imagine that SS. Peter & Paul was thoroughly razed for the ninth-century church (CBCR I, 220ff). The merit of this third hypothesis is that it would help to explain the complete disappearance of Paul's church from the sources after the Einsiedeln List, and even after Paul's pontificate.

I would suggest a further theory, however, which would fit more thoroughly the data. Our original Liber Pontificalis reference is not sufficiently clear for us to assume that we are presented with a new-built structure: "fecit noviter" does not appear in the text often enough for us to seek an archaeological proof. Generally, however, it seems to be used specifically for repairwork (as: Gregory III's work on the roof of S. Andrea at the Vatican and Hadrian I's repairs at S. Marco, S. Tiburtius, S. Prisca and S. Peter's - LP XCI, 11; XCII, 49, 50, 51 & 74). We should therefore be searching for a converted, pre-existing structure - so Lanciani's and Prandi's idea can be discarded (unless we assume some undiscovered Roman chamber beneath S. Maria Nova was used). We have already decided against Boni's suggestion (but admittedly on the rather uncertain basis of the Einsiedeln testimony). De Rossi, apart from furnishing no illustration or precise description of the re-used apse of the Basilica of Maxentius, fails to explain the disappearance of his structure from the sources. Considering that Paul's church is not even included in the donation list of Leo III, I would suggest that it disappeared even before the production of the Einsiedeln List (and we have already expressed doubt concerning such a reference). Shortly before Leo's donations, Hadrian I inaugurated a diaconia at SS. Cosma & Damiano (LP XCII, 81); this act, which would certainly have required re-adaption of new buildings, I would propose as a putative date for the suppression of Paul's church and its
combination with the neighbouring SS. Cosma & Damiano. For the actual structure of the old SS. Peter & Paul I would suggest one of the two apsed halls on either side of the rotunda: a position which conforms more precisely to "iuxta templum Rome" than any other (fig. 2.7). Indeed, Panvinio had already proposed the left hall as the diaconia in his sixteenth-century manuscript (BAC 1867, 63)\(^{16}\). Regarding any physical evidence for medieval rebuilding in either of these side-chambers, it is probably far too late to look; however, the pier-bases to either side of the left hall's entrance are formed of re-used statue-bases resting on an opus vittatum which is obviously later than the fourth-century brick structure of the hall itself.

**Conclusions**

Such was the extent of new church-building in the period 640-755. Before we go on to summarise our findings we should note some exclusions from the above catalogue. Since the accession of Hadrian I is generally (but rather too vaguely) taken as the point when the dark age ends and the Carolingian period begins, it should be mentioned that Paul I's pontificate also saw the completion of S. Silvestro in Capite at the new monastery of SS. Stephanus & Silvester, started by his brother Stephen II (LP XCV, 5 & Davis, 1992, 82, n. 9). This was a very large basilica (c. 33m by 20m) which leaves some traces in the present church on the site, and it is dealt with in detail by Krautheimer (CBCR IV, 148ff). Also excluded from the above discussion is S. Eufemia at the twelfth mile of the Via Appia, dedicated by Domnus after a substantial rebuilding (LP LXXX, 1). This building (termed "ecclesia" by the Liber Pontificalis) was situated a little too far from Rome for inclusion here; nor is there enough evidence regarding its form to warrant discussion (BAC 1869, 79ff).

\(^{16}\) Lanciani's notices of the spoliation of the marble columns of the two halls under Paul III would also tie in with Bruzio's theory that SS. Peter & Paul was demolished at this time (1989-92 II, 65; IV, 57); a contemporary drawing shows the right hall still standing and bearing a stemma on the facade (op. cit. III, 246).
As B. Ward-Perkins notes, the period also saw continual maintenance of the existing churches of the city, including the gigantic structures of S. Peter's and S. Paolo fuori le Mura, and even work carried out by the popes outside Rome (1984, 60-65; see p. 105, above, for works outside Rome; Gregory III also rebuilt the walls of Civitavecchia - LP XCII, 16). In addition there were many new oratories built within the Lateran and S. Peter's (for example, Theodore's S. Sebastianus, John VII's S. Maria, Gregory III's and Paul I's oratories at S. Peter's, all attested by the Liber Pontificalis; the re-structuring of a late domus as S. Saba is also dated to the mid seventh century - CBCR IV, 51ff). Lastly, amongst the building works not considered above, there remain new-built churches which have been vaguely assigned to the period between the seventh and eighth centuries but which remain obscure due to incomplete excavation, destruction, or incorporation in later structures.

To summarise: we have seen that in terms of numbers the churches built between 640 and 755 compare favorably with those built from 772 to 860. But, bearing in mind the lack of detail we have regarding the structure of those in the earlier period, it does seem that they were of a smaller scale than the churches of the Carolingian period. The picture deserves to be complicated, however, by noting that even within this dark age, it is easy to detect broad divisions between the minor, single-naved, oratories of the seventh century and the larger basilicas of the eighth century. Indeed, many characteristics commonly accepted as typical of certain late eighth and ninth-century buildings appear already in the works of our dark age: 3-apses (SS. Marcellino & Pietro and S. Angelo in Pescheria, which presage S. Maria in Cosmedin and S. Maria in Domnica), the probable use of galleried aisles at S. Angelo in Pescheria, the building of foundations with re-used opus quadratum blocks (possibly at SS. Marcellino & Pietro, at S. Angelo in Pescheria and S.

17 Apart from the unidentified and generally undated institutions of Leo III's donation list (p. 28, above & Davis in LP 1992, 210-8), these include: S. Cesareo de Appia (two rebuilt halls of a Roman villa whose opus vittatum re-structuring and frescoes must be considerably later than 400 AD, but earlier than the upper, late medieval church - Matthiae, 1955); an oratory built into the Basilica Julia, perhaps S. Maria de Foro (latest description & bibliography in Maetzke, 1991, 80-4); Bartoli's "oratory of S. John in Campus", perhaps built into the ruins of the Basilica Emilia in the eighth century (1912, 762ff); and an oratory discovered on the Oppian near the Colosseum, dated by Lanciani to the seventh century (Bull. Comm. 1872, 73).
Silvestro in Capite) and the use of such blocks in conjunction with spolia brick laid in undulating courses for rising walls (S. Gregorio Nazianzeno, S. Angelo in Pescheria). The works of Gregory III in particular show very strong similarities to those of the first "Carolingian" pope, Hadrian I. His reconstruction of two diaconiae - S. Maria in Aquiro and SS. Sergius & Bacchus at the Vatican - to greatly increased dimensions finds echoes in the later pope's enlargement of S. Maria in Cosmedin and SS. Sergius & Bacchus in the Forum; the strangely squat proportions of Gregory's SS. Sergius & Bacchus are also reminiscent of Heemskerk's drawing of Hadrian's church of the same name and his church of S. Cornelia at the Capracaum domusculta (Lanciani, 1897, 283, fig. 107; Christie, 1991). Gregory's expenditure on the rebuilding of city walls (both at Rome and Civitavecchia) has already been noted, as well as the political implications of such activity. Indeed, once the probable biases in the compilation of the Liber Pontificalis have been taken into account (see above), it would be fair to consider the 730s, and not the 770s, as the starting point for the accelerated building programme which is normally called the Carolingian Renaissance.

4.2 The Second Dark Age, 860-1000

Unlike the period just considered, the second dark age has not even received enough attention to warrant a disparaging quotation, except for Krautheimer's summary: "After 860 ecclesiastical architecture in Rome seems to come to a standstill. Nothing worth mentioning was built in Rome from this date up to the end of the millennium" (1942, 23). Whilst it is true that new, large basilicas ceased to be built, we shall see that this is a vast exaggeration.

The treatment of the churches of this period varies from that of 4.1 The larger

18 The date 860 does not represent anything of significance. The last early medieval churches to have received substantial study are those of Leo IV (847-855). The bibliography picks up again with Paschal II's S. Clemente (c.1108).
number of buildings, coupled with the more exiguous evidence - both physical and textual - means that what follows forms more of an overview of church architecture in the tenth century than an exhaustive, building-by-building survey. I will consider the subject in four sub-headings: those new-built churches which survive in substantially their original form (and which make the sheer absence of study of the period doubly surprising); new-built churches which do not survive; churches converted from ancient structures; and older churches which underwent substantial repair-work.

4.2.1 Surviving New-Built Churches

S. Maria in Aventino is the only surviving church of the group of monasteries endowed or founded under the impetus of Alberic II in the mid tenth century (1.3, above). It occupies the site of the prince's family house, converted into a monastery in around 942 (Hamilton, 1962, 51). The actual church survives as S. Maria del Priorato, in the form given it by Piranesi's radical redecoration of 1756. Although not a single surface was left free of his "ensemble of monstrosities", it seems from various earlier drawings that at least the form and dimensions were retained (Lanciani, 1888, xx; Cavallero & Montini, 1984). It is a single-naved, apsed building of 31m by 12m, lit before 1756 by a single round oculus above the door and four square windows in each side (fig. 3.1). Bruzio described the interior in the mid seventeenth century (Cavallero & Montini op. cit. 34): it had an open trussed roof, a brick floor, an apse adorned with frescoes of the late middle ages, and one large reinforcing arch running along each side wall (presumably like those at S. Gregorio Nazianzeno, above). The marble liturgical enclosure seems to have resembled those familiar from the eighth and ninth centuries, with relief sculptures of a lion, a griffin and various "ornamenti e fogliame" (it is probably two of these that are preserved in a modern funeral monument in the present church - op. cit. fig. 30). A small reliquary-altar in the second chapel of the left wall of the present church bears an inscription recording the deposition of relics of various saints, including St. Sebastian and St. Sabinus, and has been variously dated on stylistic grounds from the 6th to the 12th centuries; Cavallero & Montini's suggestion that this is a work executed for the original foundation of Alberic
seems sound (the head of St. Sabinus of Spoleto could have been a gift from the prince, whose family were from the same city - op. cit. 106).

The founding of the church and monastery of S. Sebastiano al Palatino by the doctor Peter in around 977 has been discussed in 1.3. The complex is situated within the precinct of Elagabalus' Temple of Sol Invictus, with the church standing on the site of the pronaos - that is, on the temple steps, where, according to the fifth-century "Passio", St. Sebastian was sentenced to death (Gigli, 1975, 7, 21). Arrigucci's reconstruction of the church in 1624 seems to have involved the destruction of the (by that time) ruinous front and side walls, whose frescoes, copied by Antonio Eclissi, showed Peter presenting his church to St. Sebastian (Gigli op. cit. fig. 15a, ff). The same structure shown there appears in the background to many of the other scenes; they suggest that the new structure, with the exception of its domed tribune, preserves the original plan of a single-naved apsed hall, measuring around 22m by 9m (our fig. 3.2). The building depicted in the frescoes was lit by an oculus above the central door and five small arched windows high up in each side (six are shown in some scenes). The end wall of Peter's church, with its disproportionally narrow apse, survives today. The interior still bears substantial traces of fresco; the exterior, observed in those parts where the intonaco has fallen way, is constructed of large re-used tufa blocks (pl. 1a; it is noteworthy that the same frescoes referred to above seem to show that the side walls of the original church were also constructed of large opus quadratum blocks). The left side wall's masonry is visible beneath the intonaco up to a height of 1m. It rests on a foundation of Roman selce concrete (the substructure of the temple steps); there follows 30cm of spolia brick before the seventeenth-century walling of short, buff-coloured bricks and well-squared, small tufa blocks begins (pl. 1b). The only other traces of the tenth-century church are various sculptural elements: four short marble architraves, decorated with interlace reliefs, are walled into the apse interior; the adjoining priest's house, a late medieval remnant of Peter's monastery buildings, displays a disparate set of marble corbels, some with motifs usually assigned to the eighth and ninth centuries; similar fragments were found in recent excavations in the monastery garden (MEFRM 1991, 109-13).
The church of S. Tommaso in Formis formed part of the monastery of the same name, known by the time of John the Deacon's Descriptio Lateranensis (c. 1073) as one of the most important in the city (VZ III, 362). Most commentators assign a foundation-date early in the eleventh century, and we might imagine it as perhaps earlier still due to the masonry type (Armellini, 1942, 615; Ferrari, 1957, 331; Pavolini, 1993b, 57 notes a document of 1050 which refers to an "abbas S. Thomae" who must be of our monastery). Most of the monastery complex, including a thirteenth-century cloister, was destroyed in 1925 when the Istituto Sperimentale per la Nutrizione delle Piante was built. The entrance facade of the monastery, including a mosaic of the famous Cosmati, Iacobus, survives within the piers of the Aqua Claudia.

The church remains intact. It is a single-naved, apsed structure measuring 21m by 10m externally (fig. 3.3). With the exception of the facade, a stucco creation of 1663, all the external walls are of spolia brick (pl. 2a). The courses undulate slightly and the bricks themselves are of heterogeneous size giving a modulus of c. 33cm; the putlog holes are more-or-less regularly spaced and framed with brick fragments (pl. 2b). Towards the height of the window-arches sporadic rows of tufelli appear. Each side wall was originally pierced by five high, small, brick-arched windows; most of these were replaced by the three large rectangular windows opened in each side during the 1663 restoration under Alexander VII. The last original window on the right side and the central window on each side have been blocked with regular spolia brickwork. The former is in fact divided into an upper and lower zone; the upper includes a triangular palm motif executed in brick, the lower a fragment of a gypsum transenna. The apse-corbelling is formed of three layers of whole bipedales, supported on narrow undecorated marble brackets. The roof is sustained by 6 trusses. The masonry from the level of the tops of the square windows upwards is of a very different type, formed of a heterogeneous mix of rounded tufelli and brick fragments; it presumably dates from the time of the last replacement of the roof trusses, probably contemporary with the 1663 restructuring already mentioned. This latter phase is all that is preserved in the interior: the walls are entirely covered in stucco and the ceiling
is formed by a suspended vault. The pavement is modern. There is no trace of a crypt.

It is interesting to compare this type of brickwork with that of most late eighth and ninth-century buildings in Rome (2.5 & 3.3, above). The brick courses of S. Tommaso tend to undulate, but not as noticeably as those of the earlier period. The modulus here is also notably greater, due to the laying of thicker mortar beds. At the same time there is not observed at S. Tommaso the homogeneous selection of brick spolia and regularity of coursing common to churches built in the city after around 1100 (Avagnina et al, 1976-7). The brick filling of S. Tommaso's windows seems more typical of this later period; and the contemporary brick caprice finds a parallel in those of the gatehouse of S. Clemente, built around 1125 (Barclay-Lloyd, 1989, 122). The windows at S. Tommaso have similar broad proportions to those of the early middle ages. In short, in its probable dating as much as in its masonry type, S. Tommaso in Formis forms something of a "missing link" between the well-documented churches of the ninth and the twelfth centuries.

4.2.2 Disappeared New-Built Churches

The following monasteries, founded as a result of Alberic's policy, had, or may have had, new-built churches attached: S. Cyriacus in Via Lata, S. Maria in Monastero, S. Cosimato and S. Peter in Horrea (see 1.3, above). The latter was installed within the Horrea Galbina in Testaccio; it may, therefore, have had little more than an oratory converted from a hall of the warehouses. S. Maria was rebuilt on the site of S. Agapitus, but nothing is known of the form of either monastery. The actual monastery church was situated "in fronte al portico" of S. Pietro in Vincoli, as we learn from a document from the latter's archive, which also states that it was demolished by Clement VII after the Sack of Rome (Lanciani, 1892b, 23). The general site of the monastery seems to have been on the ruins of the Praefectus Urbi's headquarters, the Secretarium Tellurense, whence came the inscription of an edict of 363 AD seen in our church by T. Balbino in 1465 (Lanciani, ibid).
The monastery of S. Cyriacus, whose ruinous buildings were demolished in 1661, contained a church to that saint, as well as an oratory dedicated to St. Nicholas (Cavazzi, 1908, 243ff). A plan from the archive of S. Maria in Via Lata, drawn after the redevelop­ment of the site, identifies the location of S. Cyriacus in the present Piazza del Collegio Romano; nothing is known of the form of the church, except that in 1454 it contained a minor altar to St. Donatus (Cavazzi op. cit. 246, 255)\(^{19}\). The ruined campanile observed by Bruzio in the courtyard of the Palazzo Pamphilij would presumably have belonged to S. Nicholas, considering the adjacent site of that oratory marked on the 1661 plan. The construction of the oratory should be assigned to the original foundation date of the monastery: the double dedication is recorded already in a document of 972, and Bruzio reports an ancient tradition assigning the translation of the saint's relics from Constantinople to the late tenth century (op. cit. 255, 268).

S. Cosimato stands today as an entirely new structure of Sixtus IV; the present campanile and protyron should, on stylistic grounds, date from a rebuilding rather ambiguously recorded in an inscription of 1069 (Fedele, 1898, 483). Excavations in the church in 1892 uncovered an earlier pavement 1.55m beneath the floor which we should imagine as that of the tenth-century building (NS 1892, 315ff; the precise location of the excava­tion within the present church seems to have been the large side-chapel leading off the left of the main altar, called by Gatti the "choro"). It was composed of polychrome mosaic containing panels depicting animals and transennae. Closer to the cloister (but still apparently within the church - the brief excavation notice gives no plan nor any precise locations - ibid.) were found two marble plutei of a type normally assigned to the eighth and ninth centuries; more of these are currently displayed within the cloister. Due to the paucity of information regarding the excavation, however, it is not clear whether these were found in a context to suggest they had been re-used as paving for either the tenth-century or the 1069 phase, or else were actually employed in one of these churches' liturgical enclosures. Nothing precise is known of the original plan. According to a manuscript by one Orsola,

\(^{19}\) ArmeUini gives two slightly less reliable sources (Infessura and Severano) that claim S. Cyriacus was destroyed during Innocent VIII's 1491 rebuilding of S. Maria; it would then have occupied the site of the new main altar of S. Maria (1942, 582).
superior of the convent in 1607, the pre-Sistine building occupied the site of the convent's refectory, that is, stood slightly to the left of the surviving church; this would tie in with the position of the excavated pavement, as well as create greater symmetry with the protyron (Fedele, 1898, 482).

A little is known of the form of a second group of churches built during or just after the tenth century: S. Bartolomeo all'Isola, S. Stefano degli Ungari, and two clusters of oratories situated within the Baths of Severus and around Porta Maggiore respectively. The foundations of the first two have been mentioned in chapter 1. S. Bartolomeo survives today as a baroque remodelling of an apparently late medieval church (Avagnina et al., 1976-7, 181ff). The present crypt has been proposed as substantially a survival of Otto III's church (ibid.). This seems fair, due principally to the decorative eagle-capitals at the confessio; however, in later enlargements, the intercolumniations have been bricked up, and the only original masonry appears to be the vault itself. Far from consisting of an "opus mixtum molto regolare", it is in fact very well-mixed concrete with coursed brick-fragment aggregate. This material, together with the vault's extreme shallowness, suggests that here we are presented with Roman concrete, in fact the concrete podium of the Temple of Aesculapius which stood on the site before Otto's church. The crypt would then have been excavated within this mass (as happened at S. Maria in Cosmedin and S. Basil) and the columns inserted afterwards.

S. Stefano degli Ungari was the church of the monastery of S. Stephanus Minor at S. Peter's, founded by pope Stephen II and destroyed in 1776 (LP XCIV, 40; Banfi, 1952, 38). Various sources attest a great enrichment of the monastery by king Stephen of Hungary in 1007; a 1058 bull of Benedict X confirms the right of Hungarian pilgrims to be buried at the monastery and actually refers to the "ecclesiam Stephanus rex Hungarorum construxit" (Banfi op. cit.; Schiaparelli, 1901, 483). Banfi gives a sixteenth-century plan which must represent king Stephen's church: it had the form of a small aisled basilica with five columns on each side, the whole measuring around 15m by 11m (op. cit. 33; our fig. 3.4). During its demolition, roof tiles were found with stamps of Theoderic (Steinby,
1986, 114). Assuming both plan and fabric to be those of the Hungarians' church, we would thus be presented with a return to the construction of three-naved basilicas a full century before Krautheimer's supposed Early Christian revival of the early twelfth century (1980, 177-8). Alternatively, it is possible that king Stephen's building replicated the original monastery oratory of pope Stephen. In both cases it would fall into one of our two dark ages.

From the later tenth century we have evidence from property documents that the monastery of Farfa had constructed a small complex of cellae and three oratories within the precinct of the Baths of Nero-Severus. Of these, S. Maria occupied the site of the present S. Luigi dei Francesi and was probably destroyed at the time of Sixtus IV (Huel-sen, 1927, 327). S. Benedetto was situated within the present buildings of the French School in Piazza Navona; demolished in the early seventeenth century, it appears in the 1551 plan of Bufalini and Magi's 1625 bird's eye view as a small single-naved hall (Huel-sen op. cit. 212; Frutaz, 1962, tav. 189ff & 314). S. Salvatore in Thermis, like the others, is first mentioned in the 998 Farfa document which concerns a property dispute with the priests of nearby S. Eustachio (Cavaliere, 1978, 127). Prior to 1011 it appears to have been the private chapel of the Crescentii, standing in that family's property at the present Palazzo Madama, and survived long enough to be recorded by L. Morganti in 1908 before its final destruction in the 1920s (Cavaliere op. cit. 137ff). It was located roughly on the corner of Via del Salvatore and Via della Dogana Vecchia (cf. also Magi's aerial view - Frutaz, 1962, tav. 315) and consisted of a single-naved, apsed hall preceded by two smaller square chapels on each side of the central entrance. The almost-disintegrated frescoes covering the walls of both church and chapels seemed to consist of late medieval work preceded by an earlier, presumably original cycle. By super-imposing Morganti's plan on Ghini's reconstruction of this portion of the Baths we can see that the church was constructed within the extreme southwestern corner of the Roman edifice (our fig. 3.5; Ghini, 1988, fig. 3). Excavations in 1907, however, reported that the actual walls of the Baths lay some way beneath the floor-level of S. Salvatore - in fact, 5m below street level (Bull. Comm. 1907, 330). No record was made of the building materials of S. Salvatore
during its destruction, we therefore have no way of knowing whether it re-used standing remains of the upper portion of the walls of the Baths (the ground-level having risen 5m already by the tenth century), or else was constructed ex novo, simply following the orientation of the Roman ruins.

Also from property documents - in this case from Subiaco - we learn of two private churches situated within courtyard houses near Porta Maggiore. S. Theodorus is first mentioned in a donation of the primicerius Sergius and his wife Agatha to the monastery: it is an "oratorio" situated within their house property just inside the west side of Porta Maggiore (Lori Sanfilippo, 1980, 28). After changing hands again the whole complex was converted to a monastery in 952, and is still referred to as "vocabulo Sancto Theodoro" in a twelfth-century list of Subiaco's possessions (ibid.). When the Via Eleniana arches were opened in the Aurelianic Walls in 1955, amongst the material excavated was a disparate collection of marble capitals (Marchetti-Longhi, 1955, 322); little but their location - inside the west side of the gate - would suggest a connection to S. Theodorus, however. SS. Benedictus & Scholastica appears in the documents in almost identical circumstances. First mentioned as an "ecclesia" within a large house owned by John, duke of Albano in 973, it was converted to a monastery by 977 (Lori Sanfilippo, 1980, 32). Its precise position was "ad macellum non longe ab eccl. S. Andree et Sancti Viti", that is, roughly in the position of the present Piazza Vittorio. If the remains came to light during the work of the late nineteenth century, they were never recognised.

Finally, in this category of churches built between 860 and 1000 which no longer survive, we have S. Maria Domine Rose and S. Trifone. The first was also known as S. Maria in Castro Aureo after its location in a fortified zone which grew up near the Crypta Balbi in the ninth or tenth centuries (Manacorda et al, 1994, 640ff); we have mentioned its private founding at the time of John VIII in 133. After various late medieval rebuildings the church was entirely reconstructed in the sixteenth century and survives as S. Caterina dei Funari. The excavations in the adjacent Crypta Balbi have found some fragments of painted plaster and marble choir screens broadly assignable to the early middle ages.
(Manacorda, 1982 III, 33 & 599ff); one of the plutei is identical to a piece fixed to the wall in the next-door Palazzo Mattei. The foundation of S. Trifone in 1006 has been discussed in 1.3. The church was demolished in 1746; nothing is known of its form except the views given by various Renaissance cartographers. Strozzi appears to depict it as a standard, late medieval building with three naves, a narthex and a campanile; all other views show a single-naved hall (Anon. Mantova, Bufalini and DuPerac - Frutaz, 1962, tav. 159, 167-8, 201, 248). Our fig. 3.6, from Bufalini, gives its dimensions as 18m by 14m

4.2.3 Churches Converted from Ancient Structures

After Stephen II's conversion of the Mausoleum of Honorius and Theodosius II into the church of S. Petronella in the 750s a very different attitude seems to have prevailed towards founding churches on the site of ancient public buildings. From Paul I's S. Silvestro in Capite to Leo IV's S. Maria Nova the common practice was to demolish the older edifice and begin entirely new work. However, in the late ninth century the tendency to re-use entire ancient buildings for churches re-commences. One reason for this must obviously be economic, since there can be no doubt that the process of conversion is far cheaper than erecting a new building: it is well-known that the papacy was greatly enriched during the late eighth and ninth centuries, when the practice of demolition for new buildings was common; the periods of conversion, on the other hand, broadly coincide with straitened economic circumstances. Secondly, the prestige and display of power which were inherent in the use of an ancient public building - displayed by the papacy for most of the eighth and ninth centuries - would also have been precisely what the rising nobility of the tenth century was determined to establish for itself in our second dark age.

Of the churches founded in this way by the nobility we have already discussed S. Maria de Secundicerio, converted from the so-called Temple of Fortuna Virilis by the secundicerius Stephen during the pontificate of John VIII (1.3 above). Architecturally, the conversion simply involved the addition of an apse, the opening of windows, and a rich
internal decoration of frescoes and a marble liturgical enclosure (Lissi Caronna & Priuli, 1977).

S. Barbara dei Librai, which stands today as a baroque chapel situated within the auditorium of the Theatre of Pompey, is first referred to in an inscription of 1011. This states that the church and its properties are to be relinquished by the prefect Crescentius and his wife Rogata and given over to public use (Armellini, 1942, 499; the date coincides exactly with a similar renunciation of S. Salvatore in Thermis, above). The actual foundation by the Crescentii in around 1000 seems very likely, but cannot be proved. After a fire on the site in 1634, the architect Agostino Martinelli produced a proposed plan for the new building, on which is shown the original form of Crescentius' church (Apollonj-Ghetti, 1982; our fig. 3.7). It consisted of a number of chambers inserted into one bay of the Theatre's cavea; even the transverse walls seem to follow the lines of the substructures of the Roman stepped seating. Four altars are shown, one in each of the zones opening from the central nave. Despite evidence from the fifteenth century that there was an entrance from a courtyard placed within the area of the ancient arena and entered from the Campo di Fiori, Martinelli shows the main door in a location similar to the present one (Apollonj-Ghetti op. cit. 122).

In 1.3, above, we considered the patronage of the rich butcher Beno de Rapizia and his wife Maria. Their contributions of fresco cycles to three churches - S. Urbano alla Caffarella, the oratory of the Seven Sleepers and S. Salvatore de Militis - could well be tied to the buildings' wholesale conversion to churches. The work executed at the former, in fact, seems not to have comprised any structural alteration whatever (the surviving blocking in of the colonnaded portico in characteristic baroque masonry was carried out in 1634 - Tomassetti, 1979, IV, 54). The Seven Sleepers oratory is a 6m by 4m barrel-vaulted Roman mausoleum whose apse is simply hollowed out of the end wall (Armellini, 1875). The conversion of S. Salvatore involved the extension of a 7m-wide Roman brick chamber (possibly part of an insula) to form a single-naved hall facing onto the Salita del Grillo (Rava, 1930, figs. 4 & 6 & Tempesta's 1593 view - ibid. fig. 2; our fig. 3.8). The
new foundations were constructed of massive re-used tufa blocks; the rising walls, converted back into tenements in the sixteenth century, have not survived (op. cit. fig. 6; Armellini, 1942, 225). The painted inscription at S. Urbano dates the work of Beno to 1011.

Two of Imperial Rome's most important temples were given over for conversion into monasteries in this period. Basilean monks fleeing the Saracenic invasions of southern Italy were granted permission to establish cellae and an oratory in the ruins of the Temple of Mars Ultor just before 955, perhaps by Alberic himself, who owned adjoining property in the Forum of Augustus (see 1.3., above). Excavations (and destruction) of the complex in the 1920s showed that a crypt had been hollowed out of the temple podium under the north stylobate, after the collapse of the columns (Ricci, 1926-7, 5); it was not clear whether the actual oratory, standing on the podium above, was a slightly later addition of the eleventh century or part of the original conversion phase. The frescoes of the apse, which showed St. Basil and other saints flanking the Virgin, were judged to date to the thirteenth century (Ricci, 1930, 176). During the destruction of the apse, various fragments of marble furnishings of a type normally assigned to the eighth and ninth centuries were discovered, re-used as construction material in a Baroque phase (op. cit. 180). Such material would suggest that some form of oratory had existed here since the original tenth-century foundation. Bufalini's plan of S. Basil seems to show the oratory not on the temple podium, but in a precinct immediately to the north, perhaps representing the House of the Knights of Rhodes (Frutaz, 1962, tav. 202). If we accept his drawing as the mislocated Basilean oratory, it consisted of a squat single-naved apsed hall measuring around 14m by 9.6m with its entrance facing onto the present Via Tor de'Conti (fig. 3.9).

S. Lorenzo in Miranda was set up in the Temple of Antoninus and Faustina shortly before 1050 (Ferrari, 1957, 190). The current monastery church was built by Orazio Torriani in 1601-14. Despite a claim that the remains of the early medieval building were discovered to the left of the temple's pronaos in the nineteenth century, it seems certain that the oratory was constructed on the actual podium (NS 1876, 54): an anonymous drawing of the late fifteenth century shows a small square building with a roof-mounted
belfry just inside the pronaos, to the right (Keaveney, 1988, pl. 29).

4.2.4 Substantial Repairwork

Of the various vague references to church reconstructions in the tenth century, only the rebuilding of S. Giovanni in Laterano by Sergius III (904-911) would seem to amount to the status of a "grand projet". In 896 an earthquake caused the Constantinian basilica to collapse from the main altar to the facade (LP CXVI). It remained in ruins for at least eight years: "erat in dispertione quasi in thermis, virgultis et vepribus cooperta" (Descriptio Lateranensis Ecclesiae, VZ III, 369 - incidently giving an interesting picture of the general state of the Imperial Baths at this time, c. 1073). The extent of Sergius' repairs, and how much of them survives in the present building, remains something of a mystery. The chief picture given by the Liber Pontificalis and the Descriptio is of a complete collapse of the roof: "separatio parietum et tectorum curvatio eius ruinam ante ostenderent" (VZ III, ibid.). Subsequently, most of the movable furnishings were looted. The principal obstacle to a speedy repair was the difficulty in transporting timber for the roof trusses, as we learn from a letter of John IX (CBCR V, 11). The surviving accounts of Sergius' work concentrate on the rich furnishings which he replaced (inscriptions given in Duchesne, LP CXXII, n. 2); the phrases describing the actual building work are grandiose, but give little detail: "Domnus Sergius tertius papa hanc basilicam in ruinis positam a fundamentis construxit."

The surviving fabric of the Constantinian basilica, studied by Krautheimer for almost fifty years, gives little opportunity for a detailed appreciation of masonry styles. Work up to now has concentrated on distinguishing the remaining traces of the fourth-century phase. Between these and the substantial rebuilding of Borromini in 1646-9, the

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20 Such work would include: Anastasius III at S. Adriano (Mancini, 1966, 207), John XII's creation of a chapel to S. Tommaso in the south end of the portico of the Lateran basilica (CBCR V, 1ff), the donation of columns to S. Eustachio by Alberic's widow Stefania (VZ II, 180), and undetermined works at S. Paolo fuori le Mura attested by the walling up of coins of Otto (CBCR V, 103). See also 1.3, n. 19 for Theodora and Theophylact's rebuilding of S. Maria in Via Lata.
most notable "new" feature seems to be the transepts: Josi's excavations during the 1930s established that the original foundations made no provision for these (Josi et al, 1957). On the other hand, they certainly existed by the time Borromini drew up plans for his campaign (CBCR V, 51ff). They have therefore been assigned in all probability to the tenth-century rebuilding (Ward-Perkins, 1954, 84). There were, however, many phases of reconstruction after Sergius III (CBCR V, 1ff); the only analysis of the surviving brickwork of the transepts concluded that the north transept was "100 or 200 years earlier" than the south, which was identified as dating between 1100-1300 (Josi et al., 85, 94). Obviously the question awaits further study, preferably from scaffolding, and for this reason is not an easy matter to arrange. Of the published photographs of surviving stretches of un-plastered external brickwork, Josi's fig.3 - showing a portion of Constantinian walling midway along the north aisle - seems the only evidence for a distinguishable, distinctive phase between the fourth century and the characteristic baroque work consisting of short, fragmentary brick (Nicholas IV's work of the late middle ages, on the other hand, consisted of opus saracinescum - CBCR V, 21). The patch in question seems to display the familiar undulating spolia brickwork usually associated with masonry of the ninth century, and for this reason could belong to the campaign of Sergius III. Of course, such attribution remains tenuous, to say the least. For now, we may be certain only that the work of 904-911 consisted of re-roofing the nave and re-furnishing the interior of the basilica.

Conclusions

With the exception of the Lateran basilica, we have now considered, in varying degrees of detail, twenty-three churches. Of these, sixteen appear to have been new constructions and seven conversions of ancient buildings²¹. The most immediately striking aspect of all this activity during the tenth century is that not one example was the result of

²¹ In some cases it is not clear whether we are presented with new work or conversions: the Baths of Severus and Porta Maggiore groups and S. Peter in Horrea might belong to the latter category, whilst S. Basil, S. Barbara dei Librai and S. Salvatore de Militis could be considered new-built structures.
papal funding or even initiative; in fact, apart from S. Bartolomeo and S. Stefano degli Ungari, all were private ventures. Moreover, almost all were intended for private - or at least monastic - use. In some ways we seem to have returned to the period of Late Antiquity, where building expenditure became "selfish" and private oratories constructed in houses were criticised in the law codes (CICN LVIII).

Concerning the typology of these new churches, several common factors emerge. Firstly, the buildings are generally small, single-naved structures. They have subdued external lighting but rich interiors, usually with fresco-cycles and marble liturgical furnishing. One aspect of the latter which emerges again and again is the presence of plutei, ciboria and altar fragments of a type commonly assigned to the eighth or ninth century (as at: S. Maria in Aventino, S. Sebastiano, S. Cosimato, S. Maria in Castro Aureo, S. Maria de Secundicerio and S. Basil). Noticing this, commentators often tend to move the dating of the entire church back to this period, even when there is sound evidence for a tenth-century foundation (Pesci, 1925, 22, n. 23 for S. Cosimato; Ricci, 1926-7, 6 for S. Basil; MEFRM 1991, 110 for S. Sebastiano). This is clearly ridiculous. Another unsatisfactory idea would be that all such examples represent a re-use of older material. It seems to me far more likely that we should extend the usual dating of such sculptural styles well into the tenth century and assume that these furnishings were executed, like the surviving frescoes, as a result of vigorous private patronage (cf. Gray's ideas on the palaeography of the period - 1948, 139ff).

Lastly, concerning the construction materials, we can say very little. The only church which permits a reasonably detailed study is S. Tommaso, built of spolia brick in a similar fashion to the churches of the ninth century. It is quite possible that Sergius III's reconstruction of S. Giovanni in Laterano also used brick. The re-utilisation of tufa blocks is found at S. Sebastiano and S. Salvatore de Militis. Both techniques, therefore, seem to have continued between the well-studied Carolingian and late medieval periods. The general adoption of the single-naved plan precluded the use of marble colonnades, the two possible exceptions being S. Bartolomeo and S. Stefano, both "royal" projects.
Chapter 5: City Walls and Aqueducts

5.1.1 The Aurelianic Walls: Textual Evidence

Before we present physical evidence for the early medieval reconstruction of the Aurelianic Walls - evidence which has so far eluded all scholars - we give a brief summary of the relevant sources.

The intervention of Theoderic is attested principally by the Variae of Cassiodorus, where we learn of his intention to repair the "moenia" of Rome (I, 25 & 28; II, 24). The ambiguity of this term has been mentioned above (1.1, n. 2); however, the king's specific regard for the Aurelianic Walls is further confirmed by a passage in the Historia Gothorum of Isidore of Seville (ann. 513: "muros namque eius iste redintegravit") and, as we shall see, by the presence of many brickstamps within the fabric of the walls. The immediate cause of this restoration may well have been the earthquake which struck the city in 502, also referred to in Basilius' inscriptions in the Colosseum (MGH CM I, 330; 1.1, above). The inscription in the Cambridge and Canterbury sylloges recording pope Symmachus' works at the Porta S. Petri is further testimony to a general restoration of the circuit at this time (1.2, above).

Belisarius carried out two restorations of the city walls during the Gothic sieges of Rome, as we learn in some detail from Procopius. The first, started in December 536, consisted of a general restoration and the new construction of merlons for the defence of...
archers, as well as the addition of various siege machines (III, 147). Most of the fighting over the next year seems to have centred chiefly on the eastern sector of the circuit, between Porta Flaminia and Porta Praenestina; the walls at the latter point suffered particularly (III, 185 & 223). The second building campaign, of spring 547, was a hurried attempt to make good the damage caused by Totila. After breaking back into the city at Porta Ostiensis two years later, the Gothic king continued the rebuilding (IV, 359; V, 13; cf. also the Chronicon Marcellini, MGH CM II, 108: "Totila...muros evertit...sic veniens Belisarius murorum partem restaurat"). After the war the Pragmatic Sanction, ch. 25, made theoretical provision for the repair of Rome's "fabricae publicae", and the Auctarii Haniensis Exrema, ch. 4, tells us that Narses spent twelve years restoring the towns and "moenia" of Italy; Bertolini therefore proposes a specific restoration of the Aurelianic Walls by the general (1941, 206).

Following the Lombard invasions of the late sixth century pope Gregory I organised the defence of the city, but no rebuilding work is attested (Reg. II, 45; V, 36; IX, 240). The late seventh-century cemetery list inserted in William of Malmesbury's "Gesta Regum Anglorum" excludes the following gates from its description of the city walls: Porta Chiusa, Porta Ardeatina, and one of either the Labicana or Praenestina. If we accept a date earlier than 682 for this, we might assume they were blocked during Gregory's pontificate (dating: VZ II, 135).

It was the threat of further Lombard sieges which prompted a long campaign of restoration on the part of the popes during the early eighth century. Shortly after Gisulf of Benevento had built a fortified camp on the Via Latina, the Liber Pontificalis tells us that Sisinnius started the project, ordering the burning of lime (LXXXVII, 2; LXXXIX, 2; cf. Flodoard in De Christi Triumphis apud Italiam XI, 3, where Sisinnius is termed "studiosus moenibus urbis"). Gregory II began work near the Porta Tiburtina, and the campaign was completed by Gregory III (LP XCI, 2; XCII, 15). During this time (c. 716-39) the Tiber flooded, probably causing damage at Porta Flaminia, and Liudprand made two expeditions against Rome (XCI, 6 & 22; XCII, 14). In 756 the city was besieged by Aistulf for three
months, apparently the most forceful attack since the Gothic Wars (XCIV, 41). The Lombards encamped at all points of the Trastevere circuit, at the Porta Salaria, and from the Porta Asinaria to Porta Ostiensis; siege machines were used against the walls during the campaign (CC 8-9). The last Lombard attempts, or in these cases, threats, to enter the city by force occurred under Desiderius in 771 and 773, and necessitated the blocking of the city's gates with masonry (LP XI, 28 & XCVII, 21).

The most substantial and wide-ranging reconstruction campaigns of the entire period were undertaken by Hadrian I in 774-6 and 790-1 and Leo IV in 848-9 (XCVII, 52 & 92; CV, 38-40). It has often been suggested that the description of the Aurelian Walls included in the Einsiedeln 326 manuscript may represent a survey drawn up precisely for the rebuilding campaign of Hadrian I (De Rossi & Lanciani in Richmond, 1930, 49; Cozza, 1986, 107, n. 11). This seems likely, due rather to the text's content than any attempt to date it on the basis of the same manuscript's famous itineraries; these have no connection with the description other than the fact that they were copied by the same hand, in the ninth or tenth century (VZ II, 156). Richmond summarises the relevant data: the Porta Pinciana is termed "clausa" in the description and the following gates are omitted altogether: Chiusa, Labicana, Ardeatina and Septimania; there are towers on the Mausoleum of Hadrian; and the varying numbers of necessaria, merlons and windows given for each stretch of the circuit suggest a ruinous state of the walls. All of this would point to a date substantially later than the Gothic Wars, and the blocked gates could push our terminus post quem to 773, the date of the final blocking mentioned above. The description thus falls within a period which could tie it to any of the projects of Hadrian I or Leo IV.

The restoration campaigns of Hadrian and Leo have been alluded to in other chapters, particularly with regard to the great resources of money, materials and manpower which they involved (cf. Pani-Ermini, 1992). Leo's work, which also involved the immense project of the construction of new walls around the Vatican, was carried out in the wake of the Saracenic sack of S. Peter's. As protection against further river-borne
attacks he also undertook the new construction of two towers on the Tiber near Porta Portuensis, one on each bank, linked by a chain to stop river-traffic (LP CV, 40). Aside from enemy incursions, there were almost certainly natural causes for the ruination of parts of the circuit during this time: the Tiber flooded in December 791 and in 844, causing damage at the entry and exit points (the Porta Flaminia, and the river wall at the posterula S. Agata and the Pons Agrippae - LP XCVII, 94; CIV, 22), and earthquakes were recorded in 801 and 847 (XCVIII, 31; CV, 12).

We know of no building work on the walls between that of Leo IV and the restoration of the Porta Metronia by Nicholas Mannettus and other senators in 1157 (MEC XXV, 5). The Tiber continued to flood, with inundations recorded in 856 and 860 (LP CVI, 23; CVII, 15). The circuit withstood various sieges, notably that of Hugo in 932 and various raids by marauding Hungarians in the mid tenth century (Liudprand, Antapodosis IV, 2-3; Benedict of Soracte, 52b). To judge by the ease with which Arnulf's men climbed the walls of Trastevere at Porta Aurelia in 896, using nothing more than a pile of saddles, we might imagine there were weaker points, however (Liudprand op. cit. I, 27). Benedict of Soracte, writing between 972 and 1000, appends a very condensed description of the circuit to his lamentation at the fate of the city under the Saxons (58b). Its nature is the same as that in the Einsiedeln manuscript, and Richmond has suggested it might pertain in origin to Leo IV's restoration because the new category of "turres castellatae" would fit the towers of the Leonine Walls (1930, 52). If this connection is accepted, however, we should date it after the new circuit's construction; furthermore, the number of merlons has declined from 7020 to 6800, a deterioration commensurate with the century of neglect separating Leo's work from Benedict's Chronicon.
5.1.2 Physical Evidence

In general physical evidence for these reconstructions has eluded scholars - that is, in the few cases where they have shown any interest in such investigation. As we shall see, Nibby and Richmond sought traces of Belisarius' work; any later campaigns have been shown the disdain typified by Richmond's comments: "the repairs on the wall drop to their lowest level after this time 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 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" (1930, 267). Pani-Ermini has recently criticised the "visione classica" which led former scholars to ignore these "indistinguishable" phases, but added that the "analasi archeologica...e' ancora lontana dall'essere compiuta in maniera soddisfacente...per la difficolta' oggettiva di discernere le techniche murarie utilizzate nei singoli cantieri" (1992, 496).

By now, however, there does exist a corpus of datable masonry techniques for the structures of early medieval Rome, to which we have alluded continually in previous chapters. It is the application of this corpus to the Aurelianic Walls which I now intend to summarise. Due to necessities of space I have decided to anticipate my conclusions by dealing with each intervention chronologically, as opposed to presenting a circuit-wide description followed by a discussion and chronology. Where physical evidence is considered I shall present it following a clockwise course from the Porta Flaminia (fig. 4).

#1 Theoderic

Here, unfortunately, little can be said beyond the conclusions of Richmond, who observed that the almost circuit-wide discovery of various brickstamps of Theoderic and

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Athalaric, taken in conjunction with the references given above, suggest that restoration work was certainly carried out at this time (1930, 37). No recognition has been made of the precise context of these stamps, however; usually their recording was made after a collapse or demolition of parts of the wall had already occurred. Such stamps have been found in the east tower of Porta Flaminia (Bull. Comm. 1877, 212; actual number not given; context was within good, regular brickwork), between the Amphitheatrum Castrense and the Porta S. Giovanni (in the curtain between the fifth and sixth towers east of the latter - Pfeiffer et al. 1905; eleven were found in the collapse, that is 1.32% of the total stamped finds), within the curtain opened for traffic at Porta S. Giovanni (Bull. Comm. 1917, 234), at the S. Saba re-entrant (during restoration work - Cozza, pc.) and in the Farnesina gardens (NS 1880, 32; it is not certain that this came from the section of wall running through the garden). Richmond considered that these represented only a slight refacing. However, we should imagine that those bricks in each section which were actually stamped amount to the smaller number of the stamped-unstamped proportion used at each spot. Nor should we assume that those found represent anything approaching the total which are probably concealed in the fabric of the whole circuit.

Of course, the presence of brickstamps would only represent one means of testimony to the work of Theoderic; the minute study of masonry type could give further evidence. Unfortunately, at this stage of research there is no clear, diagnostic type established for Roman masonry of the time of Theoderic - structures are known of both brick and opus vittatum (see 2.3.1, above). Judging from the meagre evidence reported above, Theoderic's work on the walls involved only brick. The way forward here would be a stratigraphic identification of brick phases which post-date the 403 phase and at the same time precede any well-dated late phases, such as those of Hadrian I (see below) or those attested by early papal stemmae (such as Nicholas V)\(^3\).

\(^3\) Ortolani has assigned the pentagonal towers of the Castro Pretorio to Theoderic, but produces no evidence (1990, 244-6).
Belisarius' first restoration consisted of a general rebuilding which included the construction of new merlons to protect the defenders' left flank. The earliest surviving merlons of the circuit would appear to be those of Nicholas V to the west of the Pyramid of Cestius (excluding, of course, those of Aurelian and Maxentius visible at certain points beneath the curtains of Honorius and Arcadius - Cozza, 1987). Richmond, however, believed that remnants of Belisarius' work survived in the stretch of the Viale Labicana (1930, 38; the present road is in fact called Via di Porta Labicana). These were photographed during restorations in the 1960s (Romeo, 1965-7, fig. 52); about 60cm of the rearward-projecting walls survive, up to five courses high and constructed of very roughly-laid spolia brick, to judge from the photograph. The exiguous evidence would probably not repay an in-situ investigation, but bearing in mind their material and context a later date seems more likely (see #4, below; it seems that the remains were sealed with asphalt during the restoration - ibid.).

For the more general work, we are again presented with the problem of a paucity of comparable contemporary evidence from sixth-century Rome. However, one point of the circuit in particular may preserve some data. The blocking of the windows of Porta Chiusa is evidently later than the Honorian opus quadratum of the gateway (pl. 3a). Arrow-slits have been left in three of the windows, so the work obviously pre-dates any papal intervention of the Renaissance or after, when musket-holes were favoured (as in the windows between Porta Metronia and Porta Latina, which bear painted inscriptions of 1868); it also highlights the military nature of the operation. Nineteenth-century photographs and drawings show that this same masonry was used for a substantial rebuilding of the interior of the gatehouse - and here also it is clear that it post-dates the Honorian phase (Richmond, 1930, fig. 35 & pl. XVIIb). The later work in both cases is executed in a regular opus vittatum consisting of alternating courses of brick and tufelli, a masonry-type found in other monuments inside and outside the city from the sixth century (see above, 2.3.1). Admittedly, opus vittatum is also used in the seventh and early eighth
centuries; but there were no attested interventions during the seventh century, and, as we shall see, the eighth-century campaigns appear to have had a diverse character. We might therefore conclude that Porta Chiusa represents good evidence of Belisarius' preparations for the first siege of Rome.

The most commonly discussed work of Belisarius is his rebuilding of parts of the circuit after Totila's destruction. Procopius tells us that one third of the wall was rebuilt in twenty-five days using "the nearest stones at hand", with no mortar, and reinforced by an outer palisade of wood (IV, 359). The presence in the surviving circuit of many portions reconstructed in massive tufa blocks is well-known. Nibby assigned all of these to the second campaign of Belisarius and the theory has been generally followed ever since, although Richmond is the only author to produce an argument (Nibby, 1821, 254-5; Richmond, 1930, 41-3 & 266-7). He proposed that in the damaged portions the outer third of the thickness of the wall was replaced, always at ground level, by the tufa blocks we see today; the mortar and brick filling was added later.

There are many problems with this theory, however. Firstly, it is possible to distinguish three types of re-used opus quadratum construction. The most disordered is that photographed by Parker (#42) and illustrated in Nibby (op. cit. tav. XX) at the seventh tower west of Porta Asinaria. Here we see a large pile of huge stone blocks massed against the base of the tower to form a rough buttress; the blocks were removed in 1869, according to Parker (Richmond asserts that many similar examples were dismantled "in recent years" - 1930, 267). The second type differs vastly and consists of roughly-coursed blocks laid with mortar and in conjunction with large portions of spolia brickwork; all such examples, as we shall see, have nothing to do with Belisarius and will be considered in section 4 below. The third type is the most ordered, distinguished from the

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4 When we find this same opus vittatum in a phase which is obviously post-Honorius we might assign it, too, to this campaign of Belisarius - for example, the buttress at the rear of the first tower to the east of Porta Metronia.

5 Listed in Richmond, op. cit. 267, n. 4-5. Gibson & Ward-Perkins do in fact suggest that some could belong to the eighth or ninth centuries (1979, 50, n. 24).
latter by the absence of inter-penetrating brickwork, by the regular coursing and homogeneous selection of the blocks, and the approximation of a header-and-stretcher technique; examples survive in the south wall of the Castro Pretorio, in the fifth tower west of Porta Maggiore, and the second curtain west of Via Zabaglia in Testaccio (pl. 3b).

There are no dated parallels anywhere in sixth-century Rome for such work in opus quadratum; however, judging from the unique circumstances of Belisarius' repairs, this is not surprising. The first type, it seems to me, is that which most clearly matches Procopius' description - of work done in great haste by the soldiers, under the eye of the enemy, using no mortar and with blocks gathered indiscriminately. It would also have parallels with another extemporary construction of the general, that is, the wall of "great stones" placed inside the Porta Flaminia which was dismantled literally overnight (III, 189, 331).

Richmond observes of Belisarius' work: "mortar cannot have been contemplated, owing to the extreme width of the joints"; therefore the mortar we see today in our types two and three was added later (op. cit. 267). This cannot have been the case in our type three (pl. 3b). Here, it is clear, the joints are extremely thin. The blocks have been well-selected, well-coursed, and tend to be laid according to a header-and-stretcher method, with larger-blocked courses to the bottom and smaller to the top. It is precisely the technique observed in the Byzantine defences of North Africa and Mesopotamia, most of which slightly post-date the campaigns of Belisarius (Goodchild & Ward-Perkins, 1953, pl. 18, 19a & 20; Pringle, 1981, 133-8; Crow, 1981, figs. 3-12). Due to this parallel, and the clear difference between the technique here and the description of Procopius, we should assign our few surviving examples in Rome to the Byzantine period, but after the sieges; the post-war administration of Narses and the Pragmatic Sanction would seem a likely context⁶ (cf. 1.1, above).

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⁶ Procopius also refers to a rebuilding of the walls of Tivoli during the war (III, 319; IV, 367); Giuliani assigns two surviving stretches of re-used opus quadratum in the town to Byzantine rebuilding, both of which resemble our type 3 (1970, 71 & 113). Regarding other possible interventions at Rome during the period, Richmond has demonstrated that the Greek crosses and inscriptions which appear around the circuit are to be assigned to Honorius, not Belisarius (op. cit. 107-8). Parker's photograph of the now-
#3 The Early Eighth Century

The campaign of Sisinnius, Gregory II and Gregory III was the first for over 100 years; furthermore, once finished, it enabled the circuit to withstand the "diversis machinis et ad inventionibus plurimis" of the besieging Lombards (CC 9). It must therefore have involved substantial building work. The problem in identifying any surviving remains of such work lies in the lack of comparable masonry from the city in this period. The standard benchmark for early eighth-century walling is the rough opus vittatum annular crypt of S. Crisogono (see above, 2.3.1) which would not necessarily serve as a suitable comparison for fortifications. Considering the suggested dating of S. Gregorio Nazianzeno to 741-52, however, we might be permitted to expect that the characteristic building techniques normally connected with the period 772-855 in Rome were already in use considerably earlier (see above, 4.1, #11ff). Therefore, we shall provisionally include this intervention of the early eighth-century popes in the next section, drawing attention where possible to potential distinctions between the earlier and later campaigns.

#4 Hadrian I and Leo IV

As we have continually noted, the masonry type which shows the most easily-recognisable characteristics and which is also the most securely-dated in the entire early middle ages in Rome is that used in the buildings constructed by the sequence of popes from Hadrian I to Leo IV. To recapitulate: this masonry consists of spolia brick laid in notably undulating courses with thin mortar beds, giving a modulus varying between 23cm and 31cm but usually inclining towards the lower figure. The bricks themselves tend to be good Roman material, often including whole tegulae, sesquipedales and bipedales. Putlog holes are irregularly-spaced, often round and usually lacking in brick frames. The walls demolished Porta Salaria shows the gate arch and facade rebuilt in good brick; accepting our attribution of Belisarian work as opus vittatum, this brickwork could be due to either Valentinian III or Theoderic (Parker cat. #7).
sometimes run out of plumb. When other materials - tufelli or fragments of marble and travertine - are included, they usually appear mixed into the brick courses in an indiscriminate way as opposed to forming regular, alternating courses of their own. At the same time, we observe the re-use of large opus quadratum tufa blocks. These are more commonly used for foundations, or at the base of rising walls, but occasionally appear interspersed with the brickwork, sometimes even to a great height.

A careful survey of the Aurelianic Walls shows that these techniques are used, either separately or together, in a great many areas. In such cases we are clearly in the presence of the reconstructions of either Hadrian I or Leo IV. In certain examples, evidence can be proposed which would incline towards one or other of these projects; in general, however, it still proves difficult to distinguish precisely between the techniques used throughout the period 772-855. Indeed, as we shall see, sometimes it is possible that such masonry suggests an intervention of Gregory II or III. For now, we present the first evidence for these papal works, proceeding in a clockwise direction from the Porta Flaminia (or rather from the first tower to the west of the gate)⁷.

This tower is the last surviving part of the circuit between Porta Flaminia and the Tiber (pl. 4a). Until recently it was covered in the same grey intonaco that we see on the curtain walls to each side. The well-preserved merlons and the short cambered base are late papal work, perhaps of Nicholas V. Where the intonaco has fallen away the original brickwork of the body of the tower is clearly visible, composed of notably-undulating spolia elements as described above. Marble fragments, possibly of marble tegulae, are introduced in the upper courses. Of the first row of putlog holes above the cambered base, two are visible to the left: they are without brick frames and of irregular height. No original windows are visible in the tower. According to Professor Cozza there are no visible signs of antiquity inside the tower, which now forms a part of the carabinieri offices.

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⁷ I am still some way from being ready to present a detailed description, including plans and elevations, of every single curtain and tower which displays such work; at present I have more data for the southern portion of the circuit. For an in-depth survey of four such towers, see my forthcoming article in "Archeologia Medievale" (1995).
in Piazza del Popolo.

The clear survival here of work of either Hadrian I or Leo IV can be viewed in connection with some vague secondary evidence for similar work at this point of the circuit. Describing the demolition of the original Porta Flaminia, Visconti contrasted the good, regular brickwork of the east tower (where was found the brickstamp of Theoderic - #1, above) with the poor spolia brickwork of the west tower, of "tempi di mezzo" (Bull. Comm. 1877, 192). A little further to the west, between our tower and the Tiber at Lungotevere Arnaldo da Brescia, some "medieval rebuilding" of the wall came to light in 1953 (Bull. Comm. 1972-3, 32). Finally, Poggio Bracciolini's famous description of "muri fragiles ac putridi", constructed of fragments of marble and tegulae, is placed directly after his observations of the stretch running from the Porta Flaminia to the Tiber (Richmond, 1930, 54). We should therefore imagine a sizable portion of the circuit was rebuilt on each side of our tower. It is also noteworthy that it is precisely at this point that the Tiber entered the city in 791, "overthrowing the gate to its foundations" (LP XCVII, 94). The chronology of the Liber Pontificalis places the inundation after Hadrian's second restoration of the walls; we should therefore assign the rebuilding at Porta Flaminia to Leo IV.

Eastwards from the Porta Flaminia as far as the Castro Pretorio the circuit preserves a mixture of original Roman and late papal (generally Renaissance) work (Cozza, 1992-4). The only slight traces of eighth or ninth-century work are to be found in the fourth curtain to the west of Porta Pinciana, which has two patches of re-facing in undulating spolia brickwork at cornice-height. Rossini's early nineteenth-century drawing of "work of the decadence" between Porta Flaminia and Porta Pinciana, displayed in the Walls Museum at Porta Appia, shows a mixture of re-used tufa blocks and brick filling; however, there is no idea of scale, so the blocks could well represent the smaller (c. 25cm by 20cm) type favoured by the builders of the fifteenth century (attested by stemmae at many points of the circuit).

The southern wall of the Castro Pretorio, from the five-sided corner tower almost
to the Porta Chiusa, shows very good evidence for our period. Immediately after the corner, behind the tennis courts, is an initial section constructed almost entirely in undulating spolia brickwork (pl. 4b). The mortar beds are almost non-existent here; the brick courses include fragments of marble and tegulae placed with their flanges facing out. What is most significant here, with regard to our discussion of so-called "Belisarian" re-used opus quadratum, is the presence of two courses of massive tufa blocks, one at ground level, the other placed eight brick courses above. They were quite clearly laid at exactly the same time as the bricks.

Further on, at the boundary between the tennis court and the post office car-park, the eighth or ninth-century work meets the traces of a tower (pl. 5a), of which remains only the back wall, flush with the curtain, and including the fragmentary arch of its rear window. The patch of opus vittatum beneath the window could be a remnant of the work of Maxentius (Cozza, passim). From this point on we see a long section rebuilt in opus quadratum of our type 3, above. There is no admixture of undulating brickwork; the tufa blocks are laid in quite regular courses with smaller blocks towards the top. This section should be assigned to the Byzantine rebuilding after the Gothic Wars (see #2, above).

Between Porta Chiusa and Porta Tiburtina large stretches of the wall have been demolished; what remains is largely a mixture of the rebuilding of Nicholas V (along the boundary of the Aeronautica building) and, from the arch of the Acqua Felice, original Roman work. Two photographs of Parker, however, show that there were some intermediate phases in this stretch. #965 and #966 show a portion of wall where a tower has disappeared: the space is filled in with massive tufa blocks laid in the style of our type 2*. This represents further evidence against Richmond's argument for a Belisarian identification of such work: here the blocks are not simply piled against the outer face of the wall at ground level; instead, an entire tower has collapsed, or been demolished, and the rebuilding in re-used opus quadratum has continued to the full height of the adjacent curtains.

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8 Cicconetti's contemporary drawing states that this was c.550m north of the Porta Tiburtina, which places it exactly in the current gateway of the Aeronautica. My thanks to Professor Cozza for showing me the drawing, from the archive at the X Ripartazione of the Comune di Roma.
Nibby noted more portions of similar work in this stretch before 1821 (1821, 340). In these examples, it should be noted, we have observed clear eighth or ninth-century work precisely at the point where the Liber Pontificalis tells us Gregory II started his restoration in 715 (see above); it is not impossible, therefore, that some of this rebuilding represents his intervention 9.

More possible evidence for this work can be seen as we continue our path towards Porta Maggiore, specifically in the upper portion of the sixth tower south of the gateway, in Via di Porta Labicana. Here we note the familiar undulating spolia brickwork which continues from the cornice to the top of the tower. A very clear photograph of the interior of the roofless tower is given in Romeo, 1965-7, fig. 51: the brickwork has very thin mortar beds and displays a row of undulating, round putlog holes; the south wall has a rudimentary arrow-slit window. The same brickwork is visible at the level of the cornice in the following two curtains, and around the very rough brick voussoir of the following tower's south window. In such a context, it seems not unlikely that the traces of brick merlons, constructed in rough brick spolia and referred to above (#2), form part of this same phase, perhaps of Gregory II.

Running south from Porta Maggiore along Via Casilina the wall is built up against the Aqua Claudia. Much of the surviving portion was rebuilt in the fifteenth and sixteenth centuries 10. The second and fourth towers after the gate have been entirely rebuilt in undulating spolia brickwork (pls. 5b & 9a). The modern ground level at this point is some 4.6m above that at the Porta Maggiore, probably a modern accumulation, so it is possible that some Roman material survives further down; however, all the original rising walls of the front of the towers are of the same eighth or ninth-century phase (the upper parts of the second tower have been re-faced in modern brick). The brickwork, including tegulae

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9 Regarding a possible sources for such spolia, it is worth noting the discovery of a Roman wall constructed of similar-sized cappellaccio tufa blocks in Piazza di Porta S. Lorenzo (Bull. Comm. 1935, 182).

10 Witness the use of small blocks of pale red tufa with much mortar, attested in many parts of the circuit by stemmae of Nicholas V; rebuilding associated with super-imposed Acqua Felice of Sixtus V; stemma of Paul V on last tower before corner.
with their flanges facing out, gives a modulus varying from 26-30cm. The facing of the curtains to either side of our towers has not survived; it is therefore impossible to analyse the bond between the medieval work and the surrounding wall. The towers built against the aqueducts here had no internal chambers, only a merloned platform at their summit. The back of the towers and the adjoining curtains have been completely obscured by the Acqua Felice.

The curtain immediately after the fifth tower (which we have proposed as a Byzantine rebuilding of type 3 opus quadratum - #2, above) includes a large patch of re-used tufa blocks, laid with some disorder directly on top of more of the same undulating spolia brickwork - further evidence for the contemporaneous use of both of these eighth/ninth-century techniques in the city walls (pl. 6a). The substantial traces of both Byzantine and early medieval work in this whole section calls to mind Procopius' description of the particularly poor state of the wall here during the Gothic War, and, taken in conjunction with the increasingly common presence of eighth and ninth-century masonry from here onwards, the concentration of Aistulf's Lombard forces in the southern parts of the circuit.

From the corner at Via Casilina as far as the Porta Asinaria the wall survives mostly as a mixture of original Roman phases and post-Renaissance work. Nibby, however, observed what he termed Belisarian re-used opus quadratum in the remains of the eleventh and thirteenth towers west of Porta Maggiore (1821, 355). Judging from Parker's photograph of the latter (#413), however, they were rebuilt in the campaigns of either Hadrian or Leo; the bottom course of tufa blocks of the thirteenth tower survives today, and matches examples elsewhere of our type 2. The truncated tower in Viale Castrense, the sixth east of the current Porta S. Giovanni, preserves its front and east wall in undulating spolia brickwork; round, undulating rows of putlog holes are also visible (pl. 6b).

11 Supposition of Colini (1944, 116), confirmed in a recent survey of the second tower by Professor Cozza and myself.
Two towers to the east of Porta Metronia survive almost entirely as eighth or ninth-century constructions. The first is the third to the west of Piazzale Ipponio, situated in the "Circolo Tennis Roma" in Via Ipponio (fig. 5a; pl. 7a-b). The modern ground level here has buried the tower to the height of the springing of the gallery vaulting. The front and side walls rise 4.51m above this level, up to the height of the vaulting of the first-floor chamber. The back walls of the tower and of its adjacent curtains are missing. All three front walls display the by-now usual undulating spolia brickwork, here with a particularly low modulus ranging from 25-28cm. Tufelli (presumably from some opus reticulatum structure), square heating tubes and a clay antefix have been roughly introduced into the brickwork. An arrow-slit window is placed centrally in the front wall, its architrave formed of a re-used travertine slab. Four rows of putlog holes are visible, placed roughly 120 cm above one another; all but the top-row holes are round with no brick surrounds. Inside the tower, the joint of the medieval work with the Roman brick of the gallery walkway can be observed: it is particularly jagged, perhaps widened by successive settling (pl. 7b).

Our next medieval tower, the second east of Porta Metronia, gives our clearest evidence yet for an eighth or ninth-century date for the re-used opus quadratum type 2. The lower portion of the front of the tower projects considerably from the face of the upper chamber (pl. 8a). This hugely thick outer wall is not tied into the brickwork of the curtain walls and is itself composed of eight courses of large spolia tufa blocks rising to a height of 4.64m followed by 2.91m of undulating spolia brickwork, modulus 26-28cm. The blocks are predominately of a reddish-brown tufa, with a minority of peperino. Although varying in length from 26-110cm they have been laid so that the height of the courses remains a roughly constant 60cm (especially clear in the west wall). 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 the front wall, in fact, rests on a band of brickwork five courses high. In short, the securely eighth/ninth-century brickwork is contemporaneous with the blocks.\(^\text{12}\)

\(^{12}\) Furthermore, Gibson & Ward-Perkins find almost identical coursing techniques for the re-used opus quadratum of the ninth-century Leonine Walls (Tower "E" of the Passetto, 1983, 226).
The back of the tower is composed of the same well-coursed spolia brickwork as the gallery walkways, modulus 31-32cm - Roman work, probably of Honorius and Arcadius. This same brickwork is continued in the rudimentary stubs of the front of the tower where it projects from the front curtain (visible inside each chamber of the tower and outside the upper chamber - pl. 8b). In fact, the entire projecting outer block wall has been built up around the plan of the original Roman tower: where this outer wall meets the curtains there is a 6cm gap through which the inner wall can be seen.

Inside the tower, the inner face of the block wall can be observed: it has been brought to a much smoother finish, with the courses varying in height from 40-50cm. Considering that the plan presents a thickness for the front wall of 2.5m, these blocks might form as many as four rows (fig. 5b; alternatively, they may face a rubble core). Here, again, we are not presented simply with a re-facing of the fabric of the wall, as Richmond claimed, but a complete rebuilding. The upper chamber of the tower is built on the same, inner wall-plan as the Roman original. Both outer and inner faces of the front three walls, as well as the top of the stairwell, are constructed of the same irregular spolia brickwork. The inner arch of the western door to the front rampart walk is composed of a double ring of spolia bricks, a technique common in the churches of the ninth century. Throughout all faces of the undulating brickwork are visible the usual round, irregular putlog holes. The vaulted roof, rising from a projecting cornice 2.9m above the floor, is covered with yellow intonaco, and is presumably modern, as certainly are the uppermost courses of brick all around the outside of the chamber.

Our next evidence for eighth/ninth-century work is found behind the Bastion of Sangallo. The very fact that this was the only point of the circuit which Paul III felt necessary to demolish for his new defences suggests that here were some of the weakest points of the walls - perhaps representing the most concerted destruction campaign of Totila's Goths. The plan of the demolished section reconstructed from Sangallo's notes gives measurements for the five missing towers of the western spur (Huelsen, 1894, 326).
Two are c.7.5m wide, the standard Roman measurement. The three others, however, have the greater width of c.10.05m, which is exactly that of the double-thickness block tower just discussed. The final, tangible evidence that at least one of these three towers was in fact a work of Hadrian I or Leo IV comes from the actual site. The westernmost of the towers destroyed by Sangallo is in fact partly preserved within the foundations of the sixteenth-century mass (pl. 9b). Here we see, perhaps clearer than anywhere else, the characteristic masonry of the late eighth and ninth centuries, even visible in cross-section. The walls are preserved at the height of the first-floor chamber; all we can see of the lower portion of the tower is a concrete core. The re-used blocks at this level are smaller than those at the base of our last tower, and are introduced into the chiefly brick material of the walls in a much more irregular manner; the majority are of peperino. The brick spolia is laid in the usual disordered manner, except for the arches of the two surviving arrow-holes which are well-selected and carefully set^13.

Between the Bastion and Porta Ostiensis are two more sections rebuilt in tufa blocks and undulating brick, Richmond's L24 (our pl. 10b) and L34. The latter, in fact, is not a remnant of a curtain, but of a tower, which has been rebuilt in a comparable manner to that of the Parker photographs south of Porta Chiusa, considered above. Here again the blocks are used through the entire thickness of the wall (the inner face can be observed in Largo Lazzerini).

Finally, on our course towards the Tiber, we find three rebuilt towers in Viale del Campo Boario, after the Pyramid of Cestius. The first of these, Richmond's M8, is almost identical to our block-built tower to the east of Porta Metronia, except that the lower section, composed of blocks, is not stepped out from the upper half, of undulating spolia brick (pls. 11a & 12a). Nor is the coursing so precise. The size of the blocks in each course diminishes towards the upper section so that at the level of the first-floor chamber they present a similar appearance to those used in the tower behind the Bastion. An

^13 A small but comparable portion of badly-coursed spolia brick with marble fragments is preserved below the gallery behind the first curtain after Via C. Colombo (pl. 10a).
examination of the interior of the tower, opening from the Protestant Cemetery, has not been possible since it is currently used as tank space for the cemetery's water supply; this is unfortunate because the tower seems to be the only of our medieval examples to preserve the vaulting of the first floor chamber (the vaulting at the Porta Metronia tower, as stated, appears to be modern; the tower at Porta Flaminia, again, has not been entered).

The next tower to the west, situated within the Commonwealth Military Cemetery, has been rebuilt flush with the curtain; the front wall is formed of the well-laid header-and-stretcher blocks considered in #2, above. The rear wall, behind the gallery walkway, consists of spolia brickwork laid above and between rough courses of small, poorly-squared peperino blocks (pl. 11b). The masonry here is very similar to that of the tower behind the Bastion.

The last tower is found at the end of the road, on the boundary of the municipal rubbish depot. It is constructed throughout of undulating spolia brickwork (modulus 26-31cm), facing a concrete core (fig. 6; pl. 12b). The thickness of the walls in the first floor chamber is 1.5m. The roof and back wall are missing. Unlike the Bastion tower, the windows here have flat architraves formed of whole tegulae (in the side walls) and travertine slabs, including the base of a herm (in the front wall). The undulating rows of round putlog holes are spaced vertically at c.90cm intervals. The junction between the west wall and the curtain forms a crooked vertical line on the inside of the tower, 2.24m from the front corner (fig. 6c). There is a clear difference between the eight/ninth-century brickwork of the tower and the homogeneous, well-coursed Honorian brick of the curtain (modulus 31cm).

This concludes our survey of the surviving traces of the campaigns of Hadrian I and Leo IV. There is a little evidence for their work on the now-vanished stretch of the walls on the left bank of the Tiber, as well as in the Trastevere circuit. Leo IV's river towers, which flanked the Tiber near Porta Portuensis, are included in many bird's-eye views of the city. All show the pair as square. That on the left bank, however, has the
same projecting base which we observed in the tower at Porta Metronia, above (this is clearest in an anonymous seventeenth-century view given by Ashby, 1925, fig. 2). Torrigio saw what he took to be the original iron bracket for the suspended chain, embedded in a fallen block of marble on the right bank (1639, 524). At that time, both towers were standing in a ruinous condition; the western was demolished in 1695, the eastern in 1705 (Ashby op. cit.). In 1868 Bruzza discovered what he believed to be the foundations of the latter; they overlay remains of a circular funeral monument (Gatti, 1936, 69-70). However, no details were given, and the fact that he described the tower as round, when it is clearly square in all drawings should confirm Gatti's remarks regarding the inexactitude of Bruzza's whole report (op. cit. 75). Further work of Leo IV was detected in the curtains adjoining his new towers on both sides of the river, identified on the basis of their "peggior qualita" and "cattiva cortina" (Gatti, op. cit. 70; Bull. Comm. 1892, 287).

One last confirmation that these papal works continued on the right bank comes from Parker's photograph of the seventeenth tower west of the Pons Agrippae (#949, given in Cozza, 1986, fig. 47). Like our Porta Metronia tower and Leo IV's left-bank river tower, this is constructed up to a third of its height in double-thickness, re-used blocks, here apparently of travertine. Evidently undulating spolia brickwork lies directly above this; the tower is ruined at the level of the first floor chamber arrow-hole, which has been rebuilt as part of an open merloned platform (cf. also a rear view of 1788 - Cozza op. cit. fig. 49).

It would be tempting to summarise our findings by assigning specific medieval sections to specific notices of sieges and floods (indeed, we have suggested this in certain cases). However, our surviving evidence is greatly confused by the presence at all parts of the circuit of post ninth-century work, and above all by the disappearance of virtually all of the Trastevere sector and the entire river stretch; this bias prevents such a clear conclusion. For example, it would be logical to assume that those parts of the northern river wall overturned by the floods referred to above were included in Leo's campaign - but we have no proof. The heavy fighting around the Porta Salaria during both the Gothic and Lom-
bard sieges may well have necessitated repairs by Gregory II, Gregory III, Hadrian I and Leo IV, but we cannot be sure. Again, we might attempt to add up the number of surviving medieval towers and compare them with the fifteen attributed to Leo IV in the Liber Pontificalis - but of course our surviving record is by no means complete.

Regarding the masonry types described, it might again be tempting to assign those parts constructed in specific materials - only brick, for example - to one papal campaign, and other parts - say, in opus quadratum - to a second intervention. But this will not suffice. The churches of the period (our chief guide) utilise the same variety of techniques in single campaigns. Furthermore, we have seen good evidence that those towers constructed of an outer ring of tufa blocks and extended in brick (such as the left bank river tower) were of Leo IV, but that one built of brick only - to the west of Porta Flaminia - was of the same pontiff. It seems more likely that the builders of each campaign utilised materials which were closest to hand. The re-use of tufa blocks, for example, could suggest that Belisarius' soldiers had already deposited the materials in the form of rough buttresses over two hundred years earlier (cf. Nibby's drawing, considered above).

For the typology of these papal reconstructions, we are presented with a rebuilding of both curtains and towers - often a complete rebuilding, "a fundamentis": witness the many examples where the eighth/ninth-century phases run through the entire thickness of the wall. A question which remains open for the many rebuilt towers which we have considered is the nature of their roofing and staircases: in the simplest form, it is possible that they were rebuilt only to the height of the first-floor chamber, even without a roof. Here we would then see a forebear of the late medieval defences of Rome and Lazio (Lawrence, 1964). Again, the roofing may have been of timber, at the level of the first floor (our last tower in Viale del Campo Boario, in fact, preserves slightly larger, well-framed putlog holes at the top of its surviving walls, possibly the beam holes for such a covering). Some of the eight/ninth-century towers, however, rise to the full height of their Honorian predecessors: those to the west of Porta Flaminia, to the east of Porta Metronia, and in the Protestant Cemetery.
Many questions await further investigation, then. For the moment we may be satisfied that we at last are presented with physical evidence for a literal reading of the memorable Liber Pontificalis passage: "...muros huius civitatis Romanae per olitana tempora in ruinis positos et per loca plures turres ad terram eversas...totam urbem in circuitu restaurans renovavit ac decoravit" (XCVII, 92).

5.2.1 The Aqueducts: Textual Evidence

Here we summarise the notices regarding post-Roman restorations of the city's aqueducts. Briefly, they present a similar picture to that of the walls: at first, a continuation of the ordinary, everyday maintenance described by Vitruvius, Frontinus and the Theodosian Code, followed by emergency repairs carried out after the Gothic Wars and the subsequent upkeep of a much-reduced service. Ambitious interventions from the late eighth century apparently ended a century later; there followed a slow decline of the ancient infra-structure which only seems to have stopped altogether in the late middle ages.

Theoderic's interest in the aqueduct administration is testified, as usual, by the Variae of Cassiodorus. We have already mentioned his appointment of a Comitiva Formarum to maintain the service and ensure that the clearway was maintained on each side of the water-courses, his warnings against the illegal diversion of water channels and his complaints that slaves working for the aqueduct office had passed into private service (VII, 6; III, 31). These need not suggest a particularly run-down state-of-affairs, since such circumstances had affected the aqueducts since Republican times (Frontinus VII, 1; LXIV-LXXXVI; CXII-XVII; CXXVI-II). Furthermore, we know that the great bath complexes - the aqueducts' principal raison d'être - were in use until the Gothic Wars: a full service must have continued at least until then (Procopius III, 193). At the same time,
we hear from the Liber Pontificalis that pope Symmachus was busy constructing and maintaining the Church's own conduits within the city and suburbs for baptisteries, church fountains and pilgrims' baths (LIII, 7-9; for the legalistic position here, see 1.2, above).

During the first siege of the Gothic War all of the aqueducts were cut by Vitigis; at the same time, Belisarius had each channel blocked to prevent the enemy from using them to enter the city (Procopius III, 189). Although Vitigis' action need not be seen as amounting to a fundamental demolition of the aqueduct arcades, it seems that this marked the end of the use of Rome's vast Imperial water-supply, furnished until now by thirteen channels, carried into the city on at least three raised bridges (Ashby, 1935, 10-15; our figs. 4 & 7).

The fact that we know that some of the aqueducts were working again in the period c. 600-756, coupled with the evidence from the Pragmatic Sanction, the Summa Perusina, and Gregory's letters, suggests that the post-war Byzantine administration undertook a general repair of Rome's water-supply (1.1, above). Whether or not this was started under Belisarius is unclear. Our only evidence is a fragmentary inscription found amongst the masonry of Paul V's rebuilt Aqua Traiana during the eighteenth century (CIL XI 3298). Bearing in mind Belisarius' interest in the city's mills, driven precisely by the Traiana, it would seem fair to attribute this first repair to him. Ashby and Van Deman, however, go too far in assigning all evidence for "late" restorations of numerous other channels to the general, as we shall see below. Precisely which aqueducts were restored by the Byzantines remains uncertain. We should imagine that at least the four considered indispensable by the later popes were put back into service: the Traiana (also referred to from the eighth century as the Sabbatina), the Virgo, the Claudia (probably with the superimposed Anio Novus), and the Jovia (see below, 5.2.2, #2, for a discussion and identification of this aqueduct). We have no evidence that the Imperial Baths were ever used again after the war; it seems the water was deemed necessary only for the mills and various church amenities (B. Ward-Perkins, 1984, 135-49).

14 Wikander makes the very good point that the inscription could refer to a repair carried out by Belisarius before the sieges, at the same time as his first intervention on the walls (1979, 32).
Prior to the siege of Aistulf we have two specific references from the Liber Pontificalis to seventh-century papal works on the water supply. Between 625 and 638 Honorius I carried out works connected with the urban section of the Aqua Traiana, building a mill and apparently a new conduit to the Tiber (LXXII, 5). A century later Gregory II restored the water supply to S. Lorenzo fuori le Mura: "aquam fistulis conpagetis post multum tempus in eandem ecclesiam reduxit" (XCI, 2). This would presumably refer to the baths at that church, constructed in the fifth century by Hilarius (LP XLVIII, 12); the sixth-century inscribed lead fistulae mentioned in 2.2 could well be some of the pipes joined by Gregory. The source of the water might have been the castellum of the Aqua Marcia incorporated in the Aurelianic Walls just south of Porta Tiburtina (Ashby, 1930, 144); if so, this would be a very late reference to the continued service of that aqueduct. The problem here is our lack of knowledge of the numerous underground branches which diverged from all the main aqueducts inside the city and which were especially numerous on the Esquiline. A reference to a ground-level "fistula domnica qui dicitur centinaria" near S. Maria Maggiore in 1056 suggests that some continued to function very late indeed (Ferri, 1904, 190); here the source could have been the castellum of the Aqua Claudia, one of the last aqueducts to be maintained regularly (see below).

That Aistulf cut the aqueducts during the 756 siege is implied by both his general devastation of the suburbs and the fact that when Hadrian I started his rebuilding of the Traiana and Jovia they had been broken for twenty years (CC 8-9; LP XCVII, 59 & 61). During this interval the Claudia and Virgo, at least, functioned fitfully; water for use at S. Peter's had to be brought in by waggons (LP XCVII, 62, 65, 81). After Hadrian's intervention the Liber Pontificalis tells us that only the Traiana and Jovia were subject to further repairs, the former by Gregory IV and Nicholas I, the latter by Sergius II and Nicholas I (CIII, 19; CIV, 21; CVII, 16 & 66).

15 This interpolated passage is of the early eighth century, according to Mommsen (LP I, cxxv). The "formam qui conduct aqua Tiberis" presumably refers to a new channel to drive the mill.
The ultimate ruination of the Roman aqueducts should be placed in the late middle ages. We have no record of any repairs in our period after those of Nicholas I (he also installed new metal pipes at the Lateran, op. cit. CVIII, 14). The late tenth-century property documents often use the aqueducts as topographical references, but only seldom do mentions of "aqua viva" seem to suggest that a fitful supply was still reaching certain parts of the city. Hubert posits a continuing flow via the Claudia or Anio Novus as far as S. Erasmo on the Caelian, and also a ground-level channel reaching S. Maria Maggiore (the centinaria referred to above); at Porta Maggiore, the principal point of entry, there was enough water to power a private mill (1990, 76-8). In Trastevere, on the other hand, the Traiana had ceased to drive mills near S. Cosimato by 1005 (ibid.). The Traiana's branch to S. Peter's was still flowing in 1053, according to a Vatican property confirmation, but had ceased by the twelfth-century Mirabilia (Schiaparelli, 1901, 467; ed. Nichols, 74). The well-known references in the latter text to an "arcus stillans" at both the Porta Appia and before the Septizonium would suggest that even at this late stage, water was running sluggishly through both the Aqua Jovia and the Claudia (30-2). Our last reference to a functioning Aqua Virgo is the "formellum aquae vivae" in the privilege of Agapitus II to S. Silvestro in 955 (PL 133, 916).

5.2.2 Physical Evidence

Here we are seeking evidence for the repair of the aqueducts after the Gothic War. As stated earlier, the least number of aqueducts re-activated would be the four subsequently damaged in 756. In their studies of the aqueducts, Ashby and Van Deman...

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16 Despite Theoderic's continued upkeep of the aqueduct office there are no records of specific building interventions on individual aqueducts. The only possible archaeological evidence would be the stamped tile found covering the underground channel of the Virgo near S. Eustachio (NS 1881, 272; there is some confusion regarding the exact site of this find - Ashby, 1930, 168 n. 10).
noted late buttresses and re-facing of "opus mixtum" (opus vittatum) which they generally believed could be dated any time after Diocletian. Quite often such traces are rather vaguely attributed to Belisarius: at the Marcia and Anio Novus beyond Vicovaro, the Marcia and Claudia north of Porta Furba, and the Alexandriana at Pantano (Ashby, 1930, 99, 240, 310; Van Deman, 1934, 20, 155, 266 & 330). Elsewhere they are described as "late" or "very late". Such repairs, however, are noted only in these aqueducts (Ligorio's drawing of the Virgo bridge at Portonaccio shows more patches of opus vittatum - Van Deman op. cit. 172).

I have studied these examples of opus vittatum from the Claudia and the Alexandriana as well as other stretches from the same aqueducts not mentioned by Ashby or Van Deman. Naturally, given the differences in area and time involved, all vary to some degree. The Alexandriana, however, displays two very clearly defined types. One is always found within, or adjacent to, patches of undulating spolia brickwork; the courses of both brick and tufelli within the actual opus vittatum also undulate noticeably. This type will be considered below, due to its eighth/ninth-century appearance. Most of the other portions of opus vittatum from both the Alexandriana and the Claudia show no significant differences from those of dated Roman buildings from Late Antiquity up to the late sixth century: regularly-laid brick and tufelli with one course of tufa to 1-3 of brick (pls. 13-15a).

Nothing here would prevent an attribution to the post-war Byzantine repairs, but due to the wide range of the masonry date a connection with a late Roman restoration would also be tenable, at least for the Marcia and Anio Novus (there are notices of restorations of the Anio Novus outside the city in 381, and of the Marcia springs under Honorius and Arcadius - Chastagnol, 1960, 358). However, we have no records of any late Roman repairs to the Claudia or Alexandriana. Some of the most characteristic opus vittatum reinforcement to the former is found in close proximity to the Goths' camp at

17 The vast length of the Claudia-Anio Novus has meant that my survey has not extended much further than Tivoli.
Torre Fiscale (pl. 13a). Furthermore, it is precisely the opus vittatum masonry of these two aqueducts which shows the strongest similarities with late sixth-century work - S. Lorenzo fuori le Mura, for example. We might therefore accept these traces as evidence of Byzantine repairs of the Claudia and Alexandriana.

For the papal works in this period there is virtually no archaeological evidence. The many baptisteries in the city's churches would not necessarily have been supplied by aqueducts\(^1\). Symmachus' works at S. Agata on the Via Aurelia, where he built a fountain, and S. Peter's, where he introduced water for new fountains and a public lavatory, would probably have used the Traiana for their supply. The water for the baptistery at S. Michael in the Vicus Patricius could have come from the small subterranean aqueduct running past the well beneath the nearby S. Lorenzo in Fonte (Lanciani, 1897, 391). No traces of a late phase were found at the Janiculum mills in Via Medici, re-excavated a few years ago (Bell, 1993); however, Honorius I's new mill and channel need not have been at this point of the Traiana. Other late mills are known in the city: the construction date of the one in the subterranean chamber below the north hemicycle of the Baths of Caracalla has been given variously as c.300 AD or "medieval" (Shioler & Wikander, 1983, 63; Bull. Comm. 1912, 159); the water-mill excavated in the hemicycle of the Circus Maximus seems to owe its origin to a water-channel constructed between the sixth and eighth centuries (Vittuci, 1991, 23). Both examples here were almost certainly supplied by an extension of the Aqua Antoniniana from the Baths of Caracalla. This channel will be considered under the heading of Aqua Jovia, below, where we will assign the post-Gothic War repair to precisely that considered just now on the Aqua Alexandriana.

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\(^1\) Many were very far from any known artificial supply (S. Cecilia, S. Crisogono, S. Lorenzo in Lucina); some of these could have simply used cisterns filled from wagons (LP XCVII, 81). The basin at S. Maria Antiqua must have been filled from the natural Aqua Juturna on the Palatine (Tea, 1937, 83; Foa, 1892, 332). The baths at S. Paolo seem to have used water drawn up by water-wheels from underground springs, to judge from Eusebius' inscription: "(r)otae fecit, acquam in valine(o) per mangana fecit" (ICUR ns II 4793).
Aqua Virgo

Most of the aqueduct's course is underground; those stretches raised on arcades have disappeared, but for a few arches of original opus quadratum (Ashby, 1930, 167ff). The continual use of the aqueduct from the fifteenth century to the present has obscured many phases of the underground specus, and the ancient work that survives is all Roman (Quilici, 1968). Indeed, the solitary repair in our period seems to have amounted to more of a cleaning than any new building work, since we are told that water was still running before Hadrian's intervention.

Precisely what the Virgo was used for in this period is difficult to say. In Antiquity it supplied the Baths of Agrippa and Nero, as well as the Stagnum and Euripus - all immense public works in the Campus Martius. During the middle ages the situation may have been different. From a junction beneath the Pincio it seems that branch-lines led north-west towards the Porta Flaminia (Ashby, 1930, 174): one of these may have fed the "fontana aqua viva" between the gate and S. Valentino, mentioned in the 955 bull of Agapitus II - PL 133, 916. On its course from the Pincio to the Via Lata the Virgo probably also fed a fountain at the modern Fontana dei Trevi (Cecchelli, 1958, 207). Foloard makes much of this function of Hadrian's work on the Virgo: "Multiplicat renovans diversa lavacra labore / Virgineaeque rigat rivis populi agmine formae" (PL 135, 808). The second itinerary of the Einsiedeln List mentions a bath at S. Silvestro in Capite; if this was a contemporary bath at the monastery rather than a generic reference to some antique ruin it would be further evidence for the medieval use of the Virgo (VZ II, 182). The baptistery at S. Marcello, very close to the Virgo as it turned to cross the Via Lata, would be another probable destination for a branch-channel.

19 Van Deman's attribution of re-facing at the arch in Via del Nazareno to Hadrian I does not bear up to re-examination (op. cit. 174). The brickwork here is post-Roman, but more likely Renaissance or later; it certainly shows no sign of the characteristic eighth-century work.
The most controversial question regarding Hadrian's restoration of the Virgo is whether or not it continued to cross the Via Lata. The chief evidence against this is that the Einsiedeln List makes no mention of the Arch of Claudius at the Via Lata, on which the Virgo crossed the street; furthermore, we are told that at this point the Virgo is broken (VZ II, 186). Of course, if these itineraries were written before Hadrian's restoration, it is still possible that the damage was repaired during the work. Indeed, Geertman - who dates the itineraries after the restoration - believes that the expression "forma Virginis fracta" could just be a topographical expression which was retained even after the repair (1975, 173). If we accept Ligorio's 1551 drawing of the arch as being based upon recent excavation reports we might assume that much of the monument did indeed survive to the Renaissance (Ashby, 1930, pl. VIII). The most convincing proof that the water supply continued over the road to a very late period comes from Cassiano dal Pozzo's description of the discovery in 1653 of a fully-functioning stretch of the aqueduct underneath S. Ignazio (Ashby op. cit. 180-1). This would suggest that the Virgo was still used after Hadrian I's repair to water the Campus Martius, an area rich in monasteries and diaconiae, and thus in need of an artificial water-supply. The underground conduit discovered in the region of S. Eustachio with a covering of Theoderic-stamped tegulae could of course be any date after 500, and thus a connection with Hadrian's restoration cannot be ruled out (see above, note 16). Lastly, as stated earlier, the ancient purpose of the aqueduct was exclusively to provide the large public ammenities of the Campus Martius; it would be very strange for the medieval papacy to have maintained such a great engineering work simply to provide for a few fountains and baptisteries in the S. Silvestro region.

**Aqua Traiana**

Known in our period as the Aqua Sabbatina, it was restored under Hadrian I, Gregory IV and Nicholas I. Like the Virgo, most of the aqueduct's course from Lake Bracciano was underground; also like the Virgo, substantial reconstructions and continued
use from the Renaissance to the present day have greatly altered any surviving ancient remains. The aqueduct was of great importance in the early middle ages for two reasons: it drove "diverse" mills on the Janiculum, and also supplied a branch-line to the Vatican for pilgrims' baths, fountains, a public lavatory and S. Peter's baptistery (see above, 5.2.1 & 5.2.2, #1). Hadrian's work was two-fold: first, a great project outside the walls to rebuild 100 arches, and secondly, the laying of a new underground lead pipe from the main aqueduct to the Vatican (LP XCVII, 59 & 81). Subsequently, Gregory IV carried out further work related to the running of the mills, and Nicholas I restored the Vatican supply (CIII, 19; CVII, 66).

Regarding the channel from the Traiana to the Vatican not even its course is known. Any search for traces of Hadrian's work on the "100 arches" would have to be conducted in the only three stretches where the aqueduct ran overground. Neither Ashby nor Van Deman noticed any intermediate phases between those of Trajan and Paul V in the sequence of arches running from the springs north of Lake Bracciano (1930, 300-1; 1934, 334). Nothing medieval is visible today in the long stretch running to the north of the Doria Pamphilj gardens at Via Aurelia. The only remaining possibility is the great bridge over the Fosso di Cesano, substantially a work of Paul V. This is now within the property of the Vatican Radio station and only the upper portion of the arches can be seen: all are modern. Ashby observed re-used blocks of tufa used for the footings of the piers which ran across the actual stream (op. cit. 304); his photograph shows the well-joined spolia blocks, together with some rising metres of apparently undulating spolia brickwork (1986, 244). Both of these might possibly mark the only surviving work of Hadrian I (the photograph is not especially clear). In this light it is interesting that of all Paul V's inscriptions placed on the new aqueduct, this is the only one which makes any allusion to the eighth-century phase: "ab Hadriano I Pont. Max. instauratis" - which raises the (very slight) possibility that, at the time of the new work in 1608, some evidence of Hadrian's reconstruction survived, perhaps an inscription, or only some re-used medieval sculpture. Furthermore, this section of the aqueduct runs through Hadrian's domuscula of Galeria, an ideal source of labour for the "aggregans multidudinem populi" of the Liber
Pontificalis (XCVII, 59).

Aqua Claudia

In Antiquity the capacity of the Claudia-Anio Novus dwarfed that of all other aqueducts (Evans, 1994, 142). According to Geertman's chronology, Hadrian I's campaign to rebuild the aqueduct precluded any other construction work during that indiction (from summer 776 - 1975, 31). The great length and height of its raised section would have made this the most ambitious project considered so far. The levying of work gangs from the "districts of Campania" would also urge us to seek evidence for rebuilding outside the city walls. The work must be counted a success to judge from the lack of any subsequent rebuilding campaigns and the length of time for which we have notice of its continued use (5.2.1, above). It was considered necessary not only for the supply of the Lateran baths, baptistery and fountain (supplied by the branch known in antiquity as Arcus Caelimontani) but also for "many churches on holy Easter day" (LP XCVII, 62; fountain in Flodoard, PL 135, 806). At the same time, as mentioned above, it seems that many private land-holders at Porta Maggiore and on the Esquiline and Caelian availed themselves of water from the aqueduct.

In our summary of those surviving portions of the Claudia which display eighth-century work we will start at the Lateran and work our way out of the city. The first clear evidence for Hadrian's intervention comes from a photograph given by Colini (1944, fig. 54). This shows the north side of the second pier west of Via E. Filiberto; it has been entirely re-faced in clearly undulating spolia brickwork with the characteristic irregularly-

20 The early medieval use of the Claudia seems to have extended at least as far as S. Tommaso in Formis, to judge from the property deeds mentioned above and Colini's "medieval cistern" beneath that church (1944, 85). It is not impossible that the medieval supply could have continued to the Palatine, although there is no evidence; certainly the Porta Capena branch was still dripping in the twelfth century (see above, 5.2.1 and Ashby, 1930, 249 for a discussion of this branch and its possible connection to the Claudia). Very little is known of the Claudia's distribution to the Esquiline after the terminal castellum near Porta Maggiore, Roman or medieval.
spaced round putlog holes. It is not unlikely that this represents a rebuilding "a fundamentis" of the entire pier; unfortunately the entire section has been rebuilt in a restoration subsequent to the photograph. Colini adds that further traces of "ultimi restauri fatti dai papi" were destroyed during the construction of Via Filiberto (op. cit. 97). Later restorations of the arches which run through the Villa Wolkonsky encountered "very late and unskilled work" in a rebuilt arch incorporated in the current visa section of the British Ambassador's residence; the photograph reveals this as more of Hadrian's work (Baillie Reynolds & Bailey, 1966, 97). "Pier 8/9" of this stretch displays the same undulating brickwork on its north side today (pl. 15b).

So far we can account for a great deal of evidence for a thorough rebuilding by Hadrian. The next stretch, running along Via Statilia, has been almost entirely re-fashioned by the builders of Sixtus V's Acqua Felice in an even rougher manner than our eighth-century work (Parker, 1876, 128). South from the corner of the Aurelianic Walls in Via Casilina more assured work of the Acqua Felice takes over, having entirely replaced all ancient phases of the Claudia and super-imposed Anio Novus, until we reach the junction of Via del Mandrione and Via della Marrana where the Roman arches re-appear. Immediately after is a colossal buttressing wall built up against both sides of the aqueduct and rising to surround both the Aqua Claudia and Anio Novus specus (pl. 16a; this may be the "filling" described by Ashby as "very late" - 1930, 241). It is clearly a work of Hadrian I, conforming to all our past descriptions. When the following sequence of arches emerge from the property of the Banca d'Italia (I still await a "permesso" to visit this stretch; Ashby describes it as composed of a mixture of Sistine and Roman work, but with one "late wall", op. cit. 240) we see yet more eighth-century buttressing, again rising to the full height of the Anio Novus specus. Here various tufa blocks have been inserted irregularly amongst the undulating spolia brickwork, in a similar manner to previously-described contemporary work on the city walls (pl. 16b; cf. pl. 10b).

After Porta Furba the Aqua Claudia is very poorly-preserved, and what survives is assigned by Ashby chiefly to the period of the emperor Hadrian (1930, 233-6). The first
surviving arch south of the turning to Via Demetriade, however, is worthy of note. It amounts to a complete re-cladding of the tufa piers with a wall of undulating spolia brickwork, into which have been mixed nine irregularly-spaced courses of marble fragments (pl. 17a).

South of Torre Fiscale comes the famous continuous sequence of peperino piers which runs as far as Capannelle, where the aqueduct starts to run underground (Ashby, 1930, 228-9). There are almost no traces of eighth-century work here, and indeed very little post-Claudian reinforcing of any kind (the opus vittatum proposed above as sixth-century is found buttressing the feet of some piers in this stretch - pl. 13a). The exception comes in a highly-obvious patch of brick filling on the east of a pier just south of Viale A. Claudio (pl. 17b). Obviously the much more durable peperino was not as susceptible to decay, and therefore in need of restoration, as the friable red-brown tufa used north of Torre Fiscale.

I have been unable to continue my survey to the point where the Claudia and Anio Novus re-emerge east of Tivoli. For what it is worth, neither Ashby nor Van Deman give any clue to "late" or "very late" phases in brick anywhere here (however, nor do they note the eighth-century work discussed above). What is clear from our summary is that Hadrian I's work amounted to buttressing and, in places (Via Filiberto), entirely rebuilding piers and arches up to the specus of the Anio Novus. It is possible that in the stretch running north from Porta Furba Hadrian's builders were actually using the higher specus, having blocked that of the Claudia with masonry to form a stronger support (Ashby, 1930, 237 & 238 n. 4); if so, the channel would have had to return to the lower level of the Arcus Caelimontani after Porta Maggiore.
Aqua Jovia

The name "Aqua Jovia" is unknown before the seventh century. The fragmentary itinerary included in the Einsiedeln Syllage includes the directions: "Inde ad portam Appiam; ibi forma Iopia, quae venit de Marsia et currit usque ad ripam" (VZ II 173; the syllage pre-dates the general collection of itineraries by at least a century - Silvagni, 1921, 188). Hereafter, the name "Jovia" appears frequently in the texts, in varying forms ("Iocia", "Iopia", "Tocia" etc): we hear of it in the tenth itinerary of the Einsiedeln List (VZ II, 199), in the Liber Pontificalis (5.2.1, above), and in various tenth-century property documents. The origins of the name "Jovia" as applied to this aqueduct are far from clear; neither is its topography understood. The syllage reference must describe the aqueduct known as the Antoniniana, which supplied the Baths of Caracalla. This entered the city between Porta Metronia and Porta Latina and crossed the Via Appia over the so-called Arch of Drusus, where our itinerary meets it. The Antoniniana, however, is not generally believed to have continued after the Baths; any channel from there to the "ripa", or Tiber bank, would therefore seem to represent an early medieval extension. Regarding the actual source of the Antoniniana, we are equally uncertain, because there are no actual remains of the aqueduct east of Via della Circonvallazione Appia (Garbrecht & Manscheid, 1992, 198). The common assumption is that it branched off from the Aqua Marcia half a mile further east, this on the basis of the Einsiedeln's "from the Marcia". However, there is no sure evidence that it did not in fact cross the Marcia. Indeed, the known levels would suggest that the height of the Marcia at the proposed junction would have been far too great for such a source (a sudden drop from c.60m to 41.76m - levels in Garbrecht & Manscheid, 208ff).

21 Any connection with Diocletian - at least in the commonly held manner - should be ruled out. The idea was first proposed by Lanciani, who imagined that "Jovia" must apply to the third-century emperor who adopted this title (1880, 107; followed by Ashby and all other commentators). However, no connection was ever made between Diocletian and an aqueduct in Antiquity, let alone an Aqua Jovia, which, as we have noted, is unknown before the Einsiedeln Syllage. There is not even any certain evidence that Diocletian restored any aqueduct - we can only assume that he did on the basis of the construction of his baths, supplied from the Marcia. This aqueduct, however, is still referred to by that name ("Marsia") in the same Einsiedeln passage which introduces the Jovia. Renewed study of the sudden medieval appearance of the toponym should perhaps begin with a possible connection to some epigraphic reference to "Jovia" in proximity to the stretch of the Antoniniana described in the syllage.
If the Jovia-Antoniniana did cross the Marcia it would be on a more-or-less precise line with the last known trace of the Aqua Alexandriana (fig. 8). The remains of this aqueduct run almost continuously eastwards of Via di Tor Pignattara to the springs at Pantano - but absolutely none are known to the west of the former. The levels of the last known traces of the Alexandriana (46m) would ensure a regular gradient for a proposed link-up with the last known traces of the Antoniniana (41.76m; the level of the Marcia at the commonly-accepted divergence of the Antoniniana is a huge 60m - all levels from Lanciani, 1880). So far the geographical conditions would allow this theory. The historical evidence gives further proof. No satisfactory reason has ever been produced to link the remains known as the Aqua Alexandriana with the actual name; nor has any explanation been given for the absolute dearth of any remains of the aqueduct between Via di Tor Pignattara, 3km outside Porta Maggiore, and its proposed destination at the Baths of Nero-Severus. The theory that the two aqueducts are in fact one - the Antoniniana - is neither confirmed nor disproved by Caracalla's inscription at Porta Tiburtina (CIL VI 1245). This concerns a restoration of the Marcia; the Antoniniana is described only as a new spring - "etiam fonte novo Antoniniano". It is, however, noteworthy that an actual source at a spring is referred to, as opposed to a simple branch off the Marcia.22

Two further pieces of evidence give a final proof for the identification of the Antoniniana as a single aqueduct running from Pantano to the Baths of Caracalla. Firstly, two tenth-century documents actually refer to the so-called Alexandriana at a property four miles down the Via Labicana as "forma Iovis" and "forma Jovis" - that is, the same aqueduct as our "forma Iopia" at the Arch of Drusus in the Einsiedeln List (Ashby, 1930, 308 n. 2; PL 133, 1023. Lanciani, followed by Ashby op. cit. 91, misquotes this second document, giving the impression that a location near Tivoli is meant - 1880, 107; the

22 If this theory is accepted, a new identification of the Aqua Alexandriana of the texts should be made. Our primary reference - the Historia Augusta, Severus Alexander 25.3 - does not actually state that the emperor's new aqueduct was built to supply the remodelled Baths of Nero, which had always been supplied by the nearby Aqua Virgo. A more likely attribution of the Aqua Alexandriana would be the new branch from the Anio Novus built to supply the so-called Trophies of Marius nymphaeum - which we know was itself a construction of Alexander (arcades remain in Piazza G. Pepe). This subject, of course, requires much new research.
topography is explained most clearly by Lori Sanfilippo, 1980, 37). Secondly, and perhaps more importantly, there is the fact that a vast amount of clearly eighth and ninth-century masonry survives in the actual body of the so-called Alexandriana - masonry which can only be that of the Aqua Jovia restored by Hadrian I, Sergius II and Nicholas I.

Such masonry is of three types, generally found on the northern (windward) side of the aqueduct: re-used tufa opus quadratum, wildly-undulating spolia brickwork, and a very rough opus vittatum (mentioned above) whose courses of both brick and tufelli undulate in the same distinct manner as the brickwork. About 400m west of the Pantano springs (shared by the Acqua Felice and now enclosed within an ACEA compound) the first sequence of low arches appears (Ashby, 1930, 309ff). From Ashby's eighty-third arch we see the regular opus vittatum discussed above, used for transverse buttresses, some of which run under the aqueduct arches. In the same stretch, additional buttresses have been built against the north face of the aqueduct: they are composed of a very rough masonry of irregular lumps of selce (abundant in this area), presumably re-used pieces of Roman aggregate (pl. 18a).

The aqueduct runs underground from here until Fosso di Tor Bella Monica; some scattered remains observed by Ashby had disappeared by the time of Quilici's study of the area (1974). The bridge over the fosso here has the north side of its first two piers rebuilt in a mixture of re-used tufa blocks and undulating spolia brickwork (pl. 19a). West of here, after another subterranean section, the aqueduct emerges to cross the squalid 1970s suburb of Torrenova. Throughout this stretch we observe all three eighth/ninth-century masonry types, usually as refacing of the northern side of the aqueduct. At one point, however, the entire structure has been rebuilt in tufa blocks (pl. 19b). Just west of Via Squinzano is a very interesting record of our papal reconstruction: within the undulating spolia brickwork of the first spandrel, on both sides of the aqueduct, are two brick carvings, reminiscent of those found on the Aurelian Walls and various churches in the city, both fifth and ninth-century: a cross and a sun symbol (pl. 18b). Immediately before the Circonvallazione Orientale, again on the north side, we see perhaps our best example of
Eight/ninth-century work is again visible at the crossing of Fosso di Tre Teste, together with the sixth-century opus vittatum mentioned above (shown in pl. 14b). The sequence of six high arches at the end of the field, just before Via Tobagi, preserves perhaps the clearest example of undulating brickwork and opus vittatum in the entire aqueduct (pl. 20b). I have found no more remains of our papal restorations between this point and Via di Tor Pignattara, except for a small patch of undulating brickwork in the scrapyard at Via degli Olmi.

The position of the aqueduct's proposed junction with the Marcia and Claudia is deep within the Banca d'Italia property at Via Tuscolana; I still await permission to study the remains here, but judging from the terrain, the Aqua Jovia would cross these below the present ground level. Previous commentators have surveyed the remains of the section of the Aqua Antoniniana between the Porta Appia and the Baths of Caracalla; most of the arches within the walls were destroyed in c.1748 (Ashby, 1930, 158; one of the ruined piers in Via Bacelli seems to preserve traces of undulating spolia brickwork).

Our evidence for a continuation beyond the 32-chamber reservoir at the Baths is various and fragmentary. Firstly, there is the Einsiedeln Sylloge, which speaks of the Jovia running "ad ripam". Furthermore, it would have been a ridiculous waste of resources for the eighth and ninth-century papacy to supply a deserted ruin. The extension from the Baths to the Tiber would presumably have taken the form of a ground level or subterranean channel, since the Liber Pontificalis states: "Forma quae vocatur Iocia...per quam decurrebat aqua per centenarium in Romana urbe" (CVII, 16). It is quite likely that the centinaria was in fact the original Roman drainage channel of the Baths, although it seems almost nothing is known of this system (DeLaine, pc). The presence of many ruined cisterns in the so-called Domus Parthicorum, just north of the site, is further evidence for an ancient use of water from the Baths. Once extended as far as the Circus Maximus, such a channel would have been able to utilise the ancient subterranean drain excavated by
Vacca at the time of Sixtus V, which ran beneath the Circus' spina and reached the Tiber near S. Maria in Cosmedin (Bull. Comm. 1892, 282). The course of the late medieval Aqua Marrana, which flowed at ground level past the north-east corner of the Baths, through the Circus Maximus to the Tiber, might give a clear picture of our Aqua Jovia in this area (FUR XXXV, XLI).

Regarding the purpose of the Aqua Jovia, we have mentioned the mills in the chambers beneath the Baths and in the Circus Maximus, both showing evidence of use prior to the restoration of Hadrian I (and the latter also displaying a phase contemporary with this - Vittuci, 1991, 23). Other medieval destinations for the water would have been the concentration of diaconiae along its course: SS. Nereo & Achilleo, S. Lucia in Settizonio and S. Maria in Cosmedin. Duchesne suggested that Nicholas I's work on the Jovia may have had a direct connection with his embellishment of the latter diaconia mentioned in the same chapter, specifically with the new "hospitium ad opus utilitatem pontificium" (LP CVII, 16).

Although we hear of no more restorations of the Aqua Jovia after Nicholas I, we have a very clear reference that it was still functioning in 958 in the countryside, where our document referred to earlier states: "aqua descendente per limites suos in forma Jovia et exeunte per formam" - which, aside from testifying to the extent and success of the papal projects, also stresses that the water supply was as useful to the suburban farms as to the metropolitan palaces (PL 133, 1023).
Chapter 6: Domestic Architecture

There are many types of building in early medieval Rome not yet considered here: palaces, episcopia, houses, fortresses, monasteries, hospitals, xenodochia, diaconiae, libraries, baths, workshops, warehouses, porticoes, prisons, synagogues, schools, and the mint. Much bibliography already exists on some of these (diaconiae and monasteries, for example); others have never even been mentioned (synagogues, the mint). What they all have in common is an almost total lack of archaeological evidence. For this reason I see no point, at the current stage of research, in running through each type individually, re-assessing textual evidence and scanty archaeological material, occasionally with only a few lines on each. Instead, I propose to highlight a unifying feature of such types, before going on to consider perhaps the most enigmatic question of early medieval architecture in the city, that is, housing.

Unlike churches, the vast majority of which were new-built, and the walls and aqueducts, which were maintained in a virtually unaltered state, almost all the buildings listed above were conversions of pre-existing structures. We have discussed the economics and politics of the re-use of ancient buildings (1.3; 4.2.3). From a purely functional point of view what is important here is that none of the buildings listed needed to be a new architectural type: their purpose was such that a great variety of pre-existing buildings, ruins and groups of buildings could be utilised. The function of a diaconia, for example, was to store and distribute food to the poor, to provide washing facilities and a place to celebrate mass, and perhaps to lodge its functionaries. These needs resulted in a disparate collection of structures being adapted, in complexes which would have had no specific appearance or plan. It therefore seems a lost cause to attempt to describe the diaconia as a specific architectural type, as having, for example, a "semi-secular" appearance with rectangular doors and windows (CBCR I, 265).

Again, to take the library as an example, we can be faced with the most protean
nature for one category of building. In our period, two structures in particular have been identified as famous libraries: that of pope Agapitus, on the Caelian, and the re-located pontifical archive at the Turris Chartularius. The former, supposedly, is the vast apsed hall on the Clivus Scaurus opposite SS. Giovanni & Paolo (Marrou, 1931): the number and size of the apse windows, apparently, are a clear guide to the typology of the Late Antique library (op. cit. 156). The latter has been identified by some as the site of Deusdedit's "cartulario juxta Palladium" (LC 346-7; BICA 1884, 5-6), but this is denied by Bartoli on the grounds that a tower is not the requisite type for a library (1947-9, 270). Here again problems are aggravated by an attempt to assign a specific architectural type to a category of building for which none exists. The nebulous character of the early medieval library is nicely apprehended from Cassiodorus' description of his Squillace monastery, whose library consisted simply of a room with numbered cupboards for manuscripts (Cavallo, 1987, 335).

The heterogeneous nature of these buildings - whose defining units range from cupboards to warehouses, baths and churches - is well-illustrated by the case of S. Maria Antiqua and its adjacent institutions. Here we have a diaconia with its own bath and church, which was perhaps in origin a palatine chapel, later annexed to a papal palace, surrounded by a xenodochium and a complex of curial offices and smaller oratories, which, following its partial destruction by earthquake, was itself converted into a monastery. The entire complex was installed within a disparate group of imperial edifices, including a palace atrium which became an enormous horrea in a later phase, a pagan shrine to the sacred healers the Dioscuri and Juturna, the house of the Vestal Virgins, and the headquarters of the aqueduct office. Where to place the boundaries of the early medieval complex, and how the internal components interlinked are as much theoretical, conceptual questions as problems of archaeological or architectural reconstruction.

The "invisibility" of such a complex, and its reconstruction by means of a broad and theoretical outlook, are nicely illustrated by Santangeli Valenzani's recent work on the Largo Argentina (1994). Here, various apparently disparate archaeological elements (blocked porticoes, a temple converted to a church in many phases, fragmentary walls in opus vittatum, the foundations of a large, beached hall, and an empty central plot), previously considered separately in various individual papers, have been re-assessed holistically and interpreted as the traces of a single complex, perhaps a monastery founded by Anicius Manlius Boethius.
As for the architectural aspect of the individual buildings, we are faced with an almost impossible problem. What has survived, together with what has been sought by earlier archaeologists and restorers, has very little to do with the period 500-1000. Now that archaeology in Rome has turned toward a specific search for the structures of the early middle ages, we are faced with the difficult question of how to recognise a conversion. How much architectural evidence would a conversion leave? New walls, subdivided rooms, blocked windows, raised floor-levels? Or simply re-plastering and painting? Or, taken to extremes, merely the introduction of new furniture? Given that little more than foundations may survive, we are not even likely to be given the opportunity to consider this meagre evidence. And when all we have to go on are a few lines in a nineteenth-century edition of Notizie degli Scavi - offhand references to "cattive cortine", "mura dei bassi tempi" or "l'eta` di mezzo" - the whole question seems hopeless.

As we move to the question of housing in the period we must bear in mind all of these factors: firstly, the lack of interest shown by earlier archaeologists and the consequent loss of relevant material; secondly, the problems of meagre physical evidence facing modern archaeologists; finally, the conceptual problem involved in our search for the early medieval house, which, like the complexes mentioned above, might amount more to a "sum-of-the-parts" than a discrete, homogeneous structure (as Hubert, 1990, 183-4; this will be amplified below). With such caveats any rash judgment, based on the apparent paucity of early medieval houses in the city, that Rome was "deserted in the later seventh or early eighth centuries", with a maximum population of 5000, must, as we shall see, be permanently postponed (Hodges, 1993, 356).

Without becoming embroiled in the subject of "urban space", we should consider briefly where people lived in early medieval Rome. The common opinion still appears to be that the population became concentrated fairly early in the region of the Campus Martius (Llewellyn, 1971, 194; B. Ward-Perkins, 1984, 125 & 145; Augenti, 1992; Evans, 1994, 146). I find absolutely no evidence for this - rather the contrary. Although we have
no detailed property documents until the tenth century, the scattered earlier references to houses and what might be termed residential areas paint a very different picture. Firstly, regarding the upper end of the property market, we have the Liber Pontificalis notices of the popes' family homes, ranging from the sixth to the eleventh centuries. Not one was from the Campus Martius. Instead we hear of the neighbourhoods of the Via Lata and forums: Stephen II, Paul I, Hadrian I, Valentine and Stephen V from the former, Leo VIII, Benedict VI and John XVII from the latter. The houses of Anastasius II, Gregory II and John XV were situated on the Esquiline and in the Suburra. John II, Agapitus, Gregory I, Honorius I, Deodatus, John XVIII and John XIX lived on the Caelian (Agapitus and Gregory on the Clivus Scauri, Honorius near the Lateran, and John XVIII and XIX near Porta Metronia). Finally, we hear that Eugenius I lived on the Aventine.

The meagre evidence for less elevated householders in the earlier centuries is again notable for its failure to concentrate on the Campus Martius. The house with gardens and guest quarters which Gregory I arranged to convert to a monastery was situated in the fourth region near S. Lorenzo in Panisperna ("ad Gallinas Albas"; Reg. III, 17; Ferrari, 1957, 12). A little later, Honorius I confirmed the lease of a house in the same region, here next to the Baths of Diocletian (PL 80, 480). Both properties could have been amongst those whose rental supplied the local churches of S. Agata dei Goti and S. Susanna, as we learn from documents considered in 1.2, above (and see note 6 below for possible archaeological evidence for such houses). If this were the general practice we should imagine thriving parishes, supplying similar rents, around each church during this period, and therefore a spread of habitation as varied as that of the churches themselves (suggested also by Bavant, 1989, 496-500). The only properties in the Campus Martius of which we hear during this time are a house next to the Baths of Agrippa with a food-shop attached, and a tavern near the Pallacensis (Circus Flaminius - Reg. VI, 42).

Of the neighbourhoods favoured by the popes, many can be connected with the

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2 LP XCV, 5; XCVII, 1; CII, 1; CXXI, 1; CXXXIV; CXXXVII; CXLIV; LI, 1; XCI, 10; CXLI; LVIII, 1; LIX, 1; LXVI, 5; LXXII, 6; LXXIX, 4; CXL; CXLVIII; LXXXVII, 1.
tenth-century houses of the laical nobility: Alberic's family estate on the Aventine, and his cousins' residence off the Via Lata, both given over as monasteries in the tenth century; aristocrats' properties donated to various institutions near the Lateran (inscription of Theodora, Lateran cloister #36), on the Caelian near S. Erasmo (donation of Crescentius Marcapullo, Lori Sanfilippo, 1980, 34), and in the Suburra (the house given over as SS. Benedictus & Scholastica by John of Albano, see 4.2.2); and more properties of Alberic north of Trajan's Forum, where the prince built his new palace after moving from the Aventine (Hamilton, 1961, 11; 1962, 51). Also by the tenth century, the Cannapara district stretching to the west of the Basilica Julia had become a quarter of the nobility (Huelsen, 1927, 321; Krautheimer, 1980, 363). At the same time, the tenth-century property documents point to a still more varied spread of habitation in the less elevated classes: it is here that we learn of the concentration of properties around the aqueducts at Porta Maggiore, S. Erasmo and S. Maria Maggiore (see above, 5.2.1). Other areas with considerable housing at this time were Trastevere, the Vatican, and the area surrounding S. Maria Nova in the Forum (Fedele, 1899, 47, 56, 89, 396; Schiaparelli, 1901, 456; Hartmann, 1895-01 I, 44; Mittarelli & Costadoni, 1755-9 I, app. 1, 124).

Hubert, who has studied the property documents in great detail, fails to find a general movement toward the Campus Martius before the late eleventh century (1990, 96, 291, 361). However, in comparison with the dispersed spread of habitation suggested up to now, we can detect an increasing presence here by the late tenth century. It could well be that it was precisely the deserted nature of the Campus Martius which led the property-developing monasteries to select the area for their new housing campaigns: a 1030 document refers to a sizeable vacant plot which is not even bounded by any notable landmark, let alone other houses (Carusi, 1948, 13); in 1019 empty land near S. Silvestro was leased for new house-building (Hartmann op. cit. I, 51). The urbanisation of the Campus Martius coincides with the period which sees our last reference to fully-functioning aqueducts (see above, 5.2); it is likely that any move towards the river was prompted as much by a need

3 All references to such documents cite individual registers' editors and will be found in "secondary sources" in the bibliography.
to re-locate water-mills as to draw drinking water (cf. the frequent reference to Tiber mills from this time in the northern Campus Martius at the posterulas - Corvisieri, 1878, 148; PL 133, 922). By the end of the century even the nobility were established here, notably the Crescentii, at the Baths of Severus (see above, 4.2.2).

Bearing in mind this pattern of settlement apprehended from the texts, it should not really surprise us when certain archaeological projects, even if geared specifically to tracing remains of early medieval habitation, fail to uncover substantial phases between the sixth century and the later middle ages. The excavations at the Crypta Balbi and the insula of S. Paolo alla Regola, and surveys of the medieval re-habitation of the Theatre of Pompey and northern Campus Martius all have this result in common - but all four sites are, unfortunately, well away from any of the populous early medieval areas considered above (Manacorda op. cit.; Quilici, 1982/3 & 1986/7; Bosmann, 1990; Quilici, 1978/9).

On the other hand, nineteenth-century excavations in more promising areas have left many tantalising references to the question. In the few cases where useful details were recorded, evidence will be considered in more detail below when we discuss the actual architecture of the early medieval house. Suffice here to draw attention to the physical presence of probable early medieval habitation in the following areas: on the Esquiline near Piazza Vittorio Emanuele and opposite S. Lucia in Selce⁴; at Porta Maggiore⁵; from the south-east slope of the Quirinal (the medieval "Gallinas Albas") to the Suburra⁶; from

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⁴ "Brick-built private buildings of the last days of the Empire" to the west of the piazza, found in conjunction with a medieval boundary-marker perhaps attributing the properties to S. Maria Maggiore (Bull. Comm. 1887, 280-1); "medieval buildings" to the east of the piazza, built over a layer of ancient tombs, and found in conjunction with a store of broken-up Roman metal refuse (NS 1888, 132); a deposit of fourth/sixth-century domestic utensils and an Athalaric tile stamp overlying imperial-era columbaria near Minerva Medica (BAC 1871, 76-9); a wall of "bassi tempi" demolished opposite S. Lucia (Bull. Comm. 1899, 41).

⁵ Medieval partition walls and a well in a columbarium in Via Statilia (NS 1914, 222); fragments of millstones found 2m below street level just outside the gate (Ciampi, 1955, 317, who imagines them to be Roman; we do know, however, of a tenth-century watermill situated in precisely this spot - see above, 5.2.1).

⁶ An early third-century insula beneath the Palazzo delle Esposizioni with six later phases of re-structuring, including partition walls of opus vittatum and brick and marble spolia (Bull. Comm. 1985, 329-331); rebuilding phases up to the sixth century of modest private houses between Via Palermo and Via Balbo (Bull. Comm. 1913, 257ff.); "medieval" ceramics found in imperial-era rooms leading off a re-paved selce.
the Via del Corso (the medieval Via Lata) to the Clivus Argentarius; through the Forum to the Colosseum; on the Caelian; east from the Capitol to Tiber Island; on the Aventine; in Testaccio; and in Trastevere.

Of course, due to the paucity of information and the contemporary lack of knowledge of late Roman and early medieval masonry, it is quite possible that many of these traces reflect work of the late fourth or fifth centuries, and not all of it habitation. However, taken in conjunction with the presence of medieval finds and the frequent (but not detailed) stratigraphic references, and of course with our textual evidence for housing of street of "tempi bassi" near S. Agata dei Goti (Bull. Comm. 1905, 105-6); beaten rubble flooring and spolia brick, tufa and marble partitions inserted in a partly-ruined Roman insula in the same area sometime after the fourth century (Bull. Comm. 1987-8, 331-5).

7 A modest "late Antique or medieval" building of poor opus vittatum containing medieval sherds and late oil lamps, found below Piazza di Montecitorio (Bull. Comm. 1985, 378-81); the lowest two levels of a Roman insula near SS. Apostoli whose chambers remained in use throughout the middle ages (Ferdinandi & Leonardi, 1992, 38ff.); burnt-out houses of "tarda eta" with floors of re-used inscriptions, and containing a sixth-century ("Claudiana") brickstamp, below the NE corner of Piazza Venezia (Bull. Comm. 1902, 287-91); an insula with considerable medieval additions and a converted chamber of the Basilica Argentaria (see below).

8 A private dwelling of "bassa eta" near the Atrium Vestae including a bath complex (Bull. Comm. 1899, 57); the converted chambers inside the Atrium Vestae (see below); continued occupation of a fourth-century house near the Arch of Constantine up to the seventh century (BA #9, 53); many sixth-century ruined chambers immediately to the north of the Colosseum at the end of the old Via dei Serpenti (Bull. Comm. 1895, 127ff.).

9 Various spolia constructions of post-Classical date in the neighbourhood of S. Stefano Rotondo (Colini, 1944, 235ff. & 275ff.).

10 Medieval phases of the Aracoeli insula (see below); structures of "bassi secoli" in conjunction with a sixth-century brickstamp found near S. Giorgio in Velabro, and various re-structuring of public monuments between here and the Theatre of Marcellus (Della Valle, 1959, 173ff. & see below); possible eighth/ninth-century rebuilding in an insula north of Via Arenula (see below); rebuilding of "cattiva fattura" in a late dwelling, itself constructed of spolia elements, just north of Campo de' Fiori (Bull. Comm. 1899, 257).

11 Walls "of the time of Hadrian I or Leo III" (but in fact of opus vittatum) inserted in an ancient opus quadratum structure between S. Alessio and S. Sabina, together with a well and a drain whose lining reused a fourth-century inscription (Bull. Comm. 1893, 5ff.; NS 1893, 119); the inscription of Theodora & Theophylact regarding a rebuilding of their family home (see above, 1.3).

12 "Scadente" chambers of opus vittatum with re-used marble paving just inside Porta Ostiensis erected over the ruins of third-century horrea; similarly-rough buildings of brick just north of here; the fill of the horrea contained late tile graves, two with stamps of Athalaric (Bull. Comm. 1935, 191-3).

13 Walls of "epoca tardissima" with thresholds of re-used marble opposite S. Crisogono, 3m below street level; upper portions in opus saracinescum (Bull. Comm. 1933, 280).
our period in all of the above areas, we have in all of these accounts enough evidence to suggest how widespread post-Roman habitation was. In short, it appears that during the nineteenth century, when excavations were carried out in the right place for retrieving remains of early medieval habitation, none of the right methods were used to apprehend such remains; conversely, now that archaeologists are using the right methods for such research, they tend to be digging in the wrong place. For this reason we are hardly in a position to consider in what kinds of structure the population of the city in our period was actually living, let alone to attempt to calculate the numbers of population on the basis of excavation (Hodges 1993). However, what follows will attempt to address this first question. We will consider the re-use of Roman houses; the conversion of other buildings to houses; and, lastly, the new building of houses (these categories, of course, will tend to overlap).

Apart from the logical argument that Roman housing would have more than sufficed for the needs of the early medieval population (Gregorovius III, 536; Krautheimer, 1980, 66), there is more substantial proof that it did indeed continue to be used throughout our period. Guidobaldi has highlighted what might be termed a glut on the housing market beginning in the early fifth century, when, as a result of the sack of Alaric, the aristocracy emigrated en masse to Ravenna and the east; from this time the surplus of relatively new, as well as older, properties obviated any need for new constructions (1986, 230). The physical evidence for some of the properties of the aristocracy listed above suggests that such structures were in fact older buildings, still used by the popes and their families as late as the seventh century. The house of Gregory I, converted to a monastery between 575 and 581, was a rambling complex whose earliest surviving parts include a first-century AD cryptoporticus and a small Severan insula; the nucleus of the monastery appears to have been a Late Antique domus planned around a peristyle and including an atrium, nymphaeum, and at least one apsidal hall. The precise configuration of the monastery's individual buildings has been variously discussed with no clear result; what is important here is that when the house was converted to the monastery, it was already at least two hundred years old, and was still recognisably of domus type when John the Deacon
described it in the ninth century. What we know of the domus of Silvia (Gregory's mother) and Honorius I, both of which were converted into monasteries by the early seventh century, conforms to this idea: that at the moment of their conversion they had been used as houses for over two hundred years.

Less tangible evidence points to similar continued use of richer properties, at least into the sixth century: the Domus Pinciana, even after some spoliation by Theoderic, was used as a headquarters by Belisarius during the first siege of Rome (Var. III, 10; LP LX, 6 & 8). Excavations at the Villa Medici have recently detected re-structuring of late fifth-century apsidal halls, apparently to create cisterns (MEFRA 1993, 440-3); the connection with Belisarius' preparations for siege are clear, although the lack of any evidence for continued habitation has lead to the hypothesis that the ruins were soon converted into the church of S. Felix in Pincis (LP ed. Davis, 145 n. 80). The Domus Palmata, used as a landmark by Cassiodorus when he confirmed a building grant to Albinus, is generally identified with the "domus ad palmam" owned by Faustus, consul in 438 (Var IV, 30; Platner & Ashby, 1929, 187). The most recent location suggested for the house is the nitched hall beneath SS. Quirico & Giulitta; if so, we would have here a very brief prolongation of the domus into our period, since the church was probably converted under Vigilius in the mid sixth century. References in the Einsiedeln List and Mirabilia to

14 Vita S. Gregorii IV, 83-5, 89 & 97. Bibliography on the complex includes: Marrou, 1931, 135ff.; Colini, 1944, 200, 207; Pani-Ermini, 1981, 35-8; Guidobaldi, 1986, 201. Most interestingly, Toesca observes that the surviving oratory of S. Andrea, built above parts of the insula block, preserves masonry of the fourth or fifth century in its roof space (as well as twelfth-century frescoes - 1972, 11).

15 S. Saba as house of Silvia: John the Deacon op. cit. I, 9; the surviving structure is a late fourth-century house, converted to a Christian oratory in the mid seventh century (Guidobaldi op. cit. 203ff.). Honorius' house, converted to the monastery of SS. Andrew & Bartholomew c.625-638, has been identified as a fifth-century re-structuring of parts of the Domus Vectiliana (LP LXXII, 6; excavations of Santa Maria Scrinari, 1989, 2217). Other houses converted into monasteries - such as those of Gregory II and Paul I - do not survive, therefore there is no way of knowing whether they represent Roman houses still in use in our period (Paul's at least would appear to have been converted from, or installed in the ruins of, the Temple of the Sun). It is likely that most of Rome's xenodochia were converted houses; however, the only one which has proven remains of a late antique domus - that of the Valerii - was probably converted very early in our period (Guidobaldi op. cit. 186ff.).

16 I should prefer to avoid becoming embroiled in the topographical arguments regarding the location of the domus palmati and the neighbouring porticus curva (full bibliography in Della Valle, 1959, 163ff). For identification as SS. Quirico & Giulitta see Guidobaldi., 1986, 207 & n. 96-7. The "domus palmati" donated to S. Maria Maggiore by Sixtus III must be a different house, since it is located "iuxta inibi basilicae" (LP XLVI, 3; Palmatus here must be a person).
palaces of Pilatus and Chromatius, on the Esquiline and in the southern Campus Martius respectively, might or might not refer to ancient domus still in use.\(^\text{17}\)

The largest of the city's numerous insulae could house up to 380 people, and would in all probability have continued to serve the inhabitants of early medieval Rome: the first itinerary of Benedict's early twelfth-century Ordo Romanus suggests that one in particular - the "insula Milicenam et draconiorum" - was used to house papal officials (Packer, 1968-9, 147; Mirabilia, ed. Nichols, 159). Very few have been carefully excavated\(^\text{18}\). However, the well-preserved Trajanic insula below the Aracoeli has many post-Roman building phases, none of which have yet been properly distinguished (Packer op. cit., where they are described as "late" or "medieval"). Photographs suggest at least three late masonry types - opus vittatum, used to divide the ground-floor courtyard, spolia brickwork, used principally to reconstruct the west walls of the third floor, and a very rough masonry composed of re-used tufa blocks, round tufelli and various stone fragments, used notably on the second floor (Packer op. cit. 132 & tav. LIV-LVIII). Precisely how each type connects with the many phases of door and window heightening, new staircase-construction and re-vaulting is not clear, although it is likely that the spolia brickwork is contemporary with the construction of the church of S. Biagio in the late middle ages (whose floor stood on the second-floor level of the insula and whose campanile survives, abutting the west wall of the upper floors). The very rough masonry of the second floor is similar to work of the baroque era on the Aurelianic Walls, and most likely should be placed in relation to the seventeenth-century rebuilding of S. Biagio as S. Rita da Cascia and an adjacent block of houses projecting from the insula (Huelsen, 1927, 218; Munoz & Colini, 1930, tav. III). The opus vittatum wall could be of any date from the fourth century onwards (Packer op. cit. 132). Of course, it is probable that the surviving

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\(^{17}\) Palatium Pilati: VZ II, 193; the building's columns are identified as those now in the Lateran cloister, #81 & #93. Palatium Cromatii: Lanciani, 1890, 541-8.

\(^{18}\) Quilici's work near S. Paolo alla Regola is a notable exception, but the only traces of early medieval habitation were animal bones and amphorae attributed to the sixth century in the lower-floor tabernae (1986/7, 407-9); such data were mirrored in the recent excavation of a Flavian insula on the Caelian (Pavolini, 1993). The usual fate of any insula with medieval accretions was "liberation", ie demolition (Munoz & Colini, 1930; Ricci, 1932; Munoz, 1932).
phases are far more complicated: Packer believed that the vault of the south chamber of the third floor was reconstructed several times before the building of the abutting Aracoeli steps in 1348 (op. cit. 142). And the huge quantity of late Roman housing discovered and destroyed just beyond the insula when the Campidoglio was "liberated", much of which had several post-fourth-century phases of opus vittatum re-structuring, would suggest that the whole area to the north and west of the Capitol continued to be inhabited into the early middle ages (Munoz & Colini, 1932\textsuperscript{19}).

Of other insulae with recognised post-Roman phases, those mentioned in notes 6, 7 and 10 would give the best evidence for continuous occupation into our period. The latter example, the lower levels of an insula off the Via Arenula near S. Carlo ai Catinari, has recently been re-excavated and publication is pending; a preliminary report mentions habitation phases continuing throughout the middle ages, and gives a photograph of a spolia-built vault-support whose masonry strongly resembles work of the eighth or ninth century (Attilia, 1986; the position of the insula is very close to the presumed site of the "Insula Milicenam et draconiorum" - Lanciani, 1890, 522). In the cases where the earliest post-Roman rebuilding appears to be late medieval (the SS. Apostoli insula, note 7, and maybe the Aracoeli), it is hard to say whether this represents re-occupation after a long period of disuse, or merely the fact that the Roman buildings only needed radical structural interventions from the eleventh century onwards\textsuperscript{20}.

There is considerable evidence that much housing in our period was installed in, or converted from, other types of buildings. Two particularly popular kinds of re-used structure were porticoes and horrea, as we hear from texts ranging from the fifth to the tenth centuries (CTh XV, 1, 12; CICC VIII, 11, 20; Var. III, 29; IV, 30; Mittarelli &

\textsuperscript{19} Colini refers to "strutture medievali" at the beginning of the old Via Tor de' Specchi and post-fourth-century restorations in the House of the Mills, and gives many photographs of opus vittatum insertions of varying quality, as well as a wall of re-used tufa opus quadratum. All of these works were carried out in Roman insulae (op. cit. 44, 53; fig. 37; tav. LXXIV-V, LXXX).

\textsuperscript{20} In only one example is there stratigraphic evidence which shows clearly that medieval re-occupation occurred after a very long period of disuse: a Cosmatesque marble-cutter's workshop installed in a Roman insula on the Viminal overlay a 1.8m deposit of rubbish and rubble (Lanciani, 1892, 241).
Costadoni, 1755-9 I, app. 1, 271ff; see 1.3 above for a discussion of the general private takeover of public buildings). Assessing - or even finding - physical evidence for such conversions is not easy, for many of the reasons already discussed: apart from the intrinsic difficulty of interpreting any architectural re-structuring - whether, for example, we are presented with a simple restoration of a building or else a conversion to a different purpose - we often have to reckon with the wholesale demolition of such phases by past archaeologists intent on "liberating" Roman structures. Even if such phases can be detected, it is almost impossible to tell if a re-worked building has been converted to a habitation or something else - a monastery, a workshop, or even a church.

As might be expected, most of our archaeological evidence comes from the central area of the city, that is, where there has been most excavation. Lanciani gave quite a clear (for the times) description of the re-use of the Atrium Vestae during our period, of which there were three phases (NS 1883, 484-6). The first, datable up to the sixth century, consisted simply of the re-use of the original chambers around the peristyle, at the ancient level; some opus vittatum partitions were added, attributed to the time of Theoderic due to the presence of a stamped imbrex found nearby. Secondly, on top of a 1.3m layer of rubbish consisting partly of the collapsed Roman vaulting, were erected "small habitations" which Lanciani connected with the activity of nearby lime-burners. One of these "casupole" was a two-room construction built against three intercolumniations of the peristyle and lit by arrow-slit windows; Lanciani imagined a date in the seventh century for this phase. Finally, after a rise in levels to 2.5m, there was built in the north-east corner of the Atrium at least one room of a habitation, under whose floor was discovered the famous tenth-century Anglo-Saxon coin hoard, buried in a cooking pot (op. cit. 487-97). The south and west wall of this chamber were newly-built. Naturally, all traces of the three phases were destroyed.

From the northern end of the Forum we have fragmentary evidence for the conversion of the three great secular basilicae to private use, in all probability to housing. The tabernae along the southwest side of the Basilica Emilia were kept in use long after the
abandonment of the central hall sometime in the fifth century (Bartoli, 1912, 759ff). Most scholars date the surviving opus sectile pavements in some of these to the mid sixth century (most recently F. & A. Guidobaldi, 1983, 346). Their rebuilt walls were destroyed during liberation, but photographs from the time of the excavations show various construction phases from the fifth century up to the late middle ages. The purpose of these early medieval changes remains unclear. Suggestions include workshops (NS 1899, 384; Huelsen, 1905, 112), a church (Bartoli op. cit. 762ff.; Huelsen op. cit. 112; F. & A. Guidobaldi op. cit. 275), a Carolingian tax office (Lanciani, 1901, 73) and a house (Huelsen op. cit. 112; Rushforth, 1902, 75; Platner & Ashby, 1929, 75). The latter seems to me the most likely. Such rich pavements are known only in churches or houses in our period, and a row of small rectangular chambers would not even remotely fit the form of any known church plan. Furthermore, the conversion of such a public building to private use at this time (mid sixth century) goes well with the noted testimony of Cassiodorus (see above, esp. 1.3).

Evidence for the conversion of the Basilica Julia is less substantial. Nineteenth-century archaeologists found various signs of re-use: a small aised oratory inserted in the last two bays of the north nave, a lime kiln, and, built up against the end of the basilica fronting onto the Vicus Jugarius, "miserable constructions of the eighth or ninth century" (Bull. Comm. 1891, 229ff; BICA 1871, 244ff; recent excavations have detected continuous early medieval occupation strata, perhaps connected to "attivita' di tipo artigianale" - Maetzke, 1991, 82-4). The evidence for housing here is quite late and all textual. We have noted the establishment by the tenth century of the "Cannapara" quarter west from this

21 The phases are: irregular opus vittatum at the threshold of tabema IX, perhaps of the 4th/5th century (F. & A. Guidobaldi op. cit. 270); spolia brick of large modulus and the occasional course of tufelli in the rear walls of tabernae VI & VII, perhaps later 5th century (op. cit. 272); re-used opus quadratum, laid on top of the Roman tufa partition walls and all along the front walls of the tabernae and used for a 2-room structure in front of the tabernae, typical of the late 8th and early 9th centuries (photograph in Capitolium 1931, 180); an indiscriminate mixture of spolia brick and fragments of marble in the rear walls of taberna VIII and the "ingresso" chamber, dated also to the 8th or 9th century (F. & A. Guidobaldi, op. cit. 275); and the side wall of this "ingresso", of opus saracinescum of the late middle ages (op. cit. 269 n. 492).

22 It is possible that the eighth or ninth-century phase referred to in note 21 could coincide with the establishment of a diaconia at the neighbouring S. Adriano by pope Hadrian I (LP XCVII, 81); the 2-room structure in particular is an entirely new work of this date, and has its partition wall constructed of undulating spolia brickwork.
point. A somewhat confused passage of the Mirabilia locates the "Temple of Ceres and Tellus" here, which consists of "two courts or houses, adorned all around with porches resting upon pillars" (ed. Nichols 96). Nichols fairly identifies this with the Basilica Julia itself; the description would fit the maintained, two-storey structure quite well, with dwellings built into the galleries in each wing. At the ground level, at least, more humble signs of habitation have recently been traced in the position of the destroyed "miserable" structures mentioned above; so far, however, the excavations have only reached levels dated to the eleventh century (Maetzke op. cit. 101-4).

The Clivus Argentarius was also known as a rich residential quarter from the tenth century (Leo VIII and Benedict VI, above). The Mirabilia refers to an insula Argentaria here in the early twelfth century, which seems to be a considerably-expanded version of the Roman insula whose lower stories survive behind the Basilica Argentaria (ed. Nichols 92: "In the end of the Insula Argentaria the temple of Vespasian"). From here and the surrounding Forum of Caesar were removed 16000 cubic metres of masonry during the excavations of 1932, much of them medieval (Ricci, 1932, 365). A drawing from the time shows how the entire north end of the basilica and the insula itself had been re-structured to form a single immense block, perhaps even incorporating the west hemicycle of the Forum of Trajan; the facade of re-used marble columns had in turn been blocked in to form more housing along the old Via delle Chiavi d'Oro (Munoz, 1932, tav. I). Like the Basilica Emilia, the two southernmost bays of the Basilica Argentaria preserve fine pavements of re-used opus sectile. There is no good evidence that this should represent a church or oratory. F. & A. Guidobaldi date a surviving portion of walling to the sixth century (op. cit. 488). It is not unlikely that this represents a rich private dwelling, for the same reasons advanced above for the Basilica Emilia.  

23 To return briefly to the topographical question of the Domus Palmata (note 16), it is worth mentioning that De Francisci identified the "Porticus Curva" (said by Cassiodorus to be next to the Domus) as the absidal exedra formed by the Hadrianic forica of Caesar's Forum (1948, 309). This has the advantage over the previous idea, in that here we are in the accepted "ad Palmam" area. We might then identify the re-used pavements of the Basilica Argentaria as those of Faustus' fifth-century house, itself inserted within the Roman structure.
In the area west of the Capitol, where we have seen evidence for the continued use of Roman insulae, there are various remains of spolia opus quadratum and opus vittatum re-structuring of Roman public buildings, notably of the so-called "portico in peperino" in the Forum Holitorium. Only an excavation here might clarify the actual purpose of these partition walls; nothing was mentioned of them, nor of the destroyed (late?) medieval housing built on and around them, when the portico was cleared in the 1920s (Munoz, 1932). Colini noted late Roman and "alto medievale" re-use of both a presumed bath block and another portico between here and the Porticus Octaviae. The former had many additions in very inferior opus vittatum (Munoz & Colini, 1930, 71 & tav. XCI-II); the latter, at a point contiguous to another insula, had its arcades blocked up with spolia masonry including a stamped tegula of Theoderic (Colini, 1941, 391-2).

Lastly, amongst this category of public monuments re-structured for unknown purposes, are the hémicycles of the Circus Maximus and Ludus Magnus. Their surviving substructures have many rebuilt partitions in spolia opus vittatum; the chambers so obtained often contain central piers of the same masonry (Vittucci, 1991, 12 actually identifies the use of timber for the roof-support in the Circus; the walls and piers of the Ludus Magnus rise from a level at least 30cm above the Roman floors). Here we are clearly in the presence of the "crypta in integrum sinino opere constructa" of the medieval property documents (see 2.4, above). In such documents the cryptae are always rented for private use, quite often having a house built above them (as Fedele op. cit. 190, 193 & 214; Carusi, 1948, 39); individual cryptae in the same ancient structure are often leased to different tenants (as with those of the Colosseum - Fedele op. cit. 193, 204, 216).

The evidence considered to now - which is more or less all we have from archaeological sources - seems to suggest that the re-use of public buildings for housing was confined to, or at least concentrated in, the ancient centre of the city. This picture could be in part a reflection on the distribution of archaeological excavation rather than ancient practice. We know from textual sources that the following, more farflung, monuments were also being used as houses: the Temple of the Sun (by Paul I's family in the eighth
century), the Baths of Nero-Severus, the Temple of Serapis and the Theatre of Pompey (by the Crescentii in the tenth), as well as various warehouses below the Aventine (leased by the monastery of S. Andrea in the tenth century - Mittarelli & Costadoni, 1755-9 I, app. 1, 271ff). Furthermore, the leasing of "cryptae" is found in every surviving monastery register, from whatever part of the city. Whilst Theoderic's policy of preserving "aesthetically pleasing buildings" in the centre seems to have been popular amongst the upper classes, it is almost certain that the re-use of ancient public structures for housing occurred wherever there were actual inhabitants - that it was as widespread as the general habitation outlined above.

Finally we consider the question of new-built housing, the least-known category of architecture yet discussed. For the textual evidence, although there is a great deal of literature on housing per se, that related specifically to new-built dwellings in our period is almost non-existent. Hubert's exhaustive digest of the property documents has enabled him to present a "type" for the tenth-century upper-class house as it might have been recognised at the time: an "accumulation" of diverse elements - ancient halls and materials, a well, a courtyard - rather than a discrete, homogeneous structure (1990, 183-4). However, this could apply to either of our previous categories: re-used Roman houses or converted public structures. Indeed, the heterogeneous nature of these would suit Hubert's description far better (such disparate groupings would be the properties of the Crescentii at the Baths of Nero-Severus and the Temple of Serapis - Cavaliere, 1978 & Krautheimer, 1980, 363). The few examples from the end of our period of deeds drawn up specifically for new housing consist of less than a dozen documents, none of which give a clue to the appearance of the proposed building (Hubert op. cit. 167). Other references to houses built on top of cryptae could well signify new-built structures erected above vaulted Roman ruins, but this is not especially clear. A "casa solaratum cum crypta sinino cooperta sub se" leased in 1011, for example, may have been simply the re-used Roman second storey (Mittarelli & Costadoni, 1755-9 I, app. 1, 196; the location near S. Clemente puts it

24 A Renaissance plan of one of the horrea at the foot of the Aventine facing the Tiber shows a two-storey house inserted in one corner (Bartoli, 1914-22, fig. 469). Regarding the conversion of horrea, cf. also the excavations mentioned in note 11, above.
conveniently close to our re-structured chambers of the Ludus Magnus). When we hear of a tower erected over a crypta near S. Lorenzo in Lucina in 1076, however, we are probably confronted with a substantially new construction (Carusi, 1948, 39). The few textual references to timber houses would certainly represent new-built structures (Hubert, 1990, 215-22). The Anglo-Saxon Borgo consisted entirely of such dwellings, as we learn from the Liber Pontificalis: after one of the many fires in the quarter, Paschal I provided abundant timber for the repair of all its houses (LP C, 7; Llewellyn, 1971, 179).

Physical evidence is equally scarce. The only archaeological evidence for timber buildings comes from post-holes, something obviously never sought-for in older excavations. These have been noted at the northern end of the Forum (assigned specifically to seventh-century market-stalls erected around the bases of the seven honorary columns - Giuliani, 1983, 86) and in the Campus Martius around the Porticus Minucia (after the fifth-century - Manacorda, 1993, 40ff). Such humble structures need not, however, be peculiar to the early medieval period: there is a prohibition of construction of "hovels or huts" in the Campus Martius already in the fourth century (CTh XIV, 4).

The earliest surviving post-Roman house in the city is probably the Casa dei Crescenzi in the Forum Boarium. Both interpretations of its dedicatory inscription would place it outside our period 25. Regarding any other more permanent early medieval houses, it is quite possible that traces survive within the structure of many monasteries and churches in the city: I am thinking of the clear ninth-century adjuncts to Leo IV’s SS. Quattro Coronati, a church where that pope had lived prior to his election and the building's great reconstruction 26; of the small priest's house adjoining S. Passera on the Via Portuensis, whose undulating spolia brickwork is certainly contemporary with the church itself, and of

25 Dating depends primarily on identifying Nicholas Crescentius, its founder. Fedele finds such a personage in 1062, Gnoli in 1163 (1940, 21; 1940, 8). The architectural techniques - saw-tooth brick cornices, falsa cortina pointing, very high-quality brick-laying and the use of large concrete vaults - would point to a late date. It might still be seen, however, as a direct descendent of the fortified palaces of the tenth-century nobility such as the Frangipani (Fedele, 1910).

26 Barberini, 1989, 17ff. Parts of the monastery (in clausura) leading off the late medieval cloister appear contemporary with Leo's building.
the following monasteries and convents, all by their nature habitations, many certainly
converted from Roman or early medieval houses, and all extremely difficult of access: S.
Martino ai Monti, S. Lucia in Selcis, S. Lorenzo in Panisperna, S. Maria del Priorato and
S. Ambrogio della Massima. This is all work for the future. For now, in summing up this
subject, it seems from the overwhelming majority of evidence available to us that early
medieval housing in Rome consisted chiefly of the re-occupation and re-structuring to
varying degrees of both older houses and older public buildings. The actual spread of
habitation seems to have been almost as widespread as that of the numerous churches in
the city. Indeed, it would be easier to list the few areas which remained more-or-less
uninhabited during the period: the northern stretch from the Campus Martius in the west
to the Castro Pretorio in the east; and the southwestern industrial area of Testaccio and
the urban section of the Via Appia.
Conclusions

We have observed a chronological division between state, church and private funding over the period. The Church's role in all public works increased steadily from 500 AD until, by the ninth century, all services were financed and organised by the papacy, using its own funds and with no outside administration. Within this broad outline, however, certain details stand out. I have given new evidence - both textual and archaeological - for the work of the post-war Byzantine administration regarding the city walls and aqueducts, as well as some devotional foundations. And throughout the period, the private sector played a substantial role in financing smallscale building works; in fact, by the tenth century, it was virtually the sole source of architectural patronage in the city.

Regarding the materials: timber came from the church estates. Other materials were generally supplied from despoiled older buildings. Such spoliation was undertaken illegally by the private sector, and legally by the church. Variations in the supply of spolia - notably in tufa, marble and tile - have been apprehended from a study of the city's buildings, and placed in the context of the papacy's growing independence and self-sufficiency from around 700 AD; after this time, the Church took responsibility for the destruction and spoliation of disused public monuments.

The greater part of labour was provided by the corvee. Craftsmen worked generally in the private sector and were contracted by the church; architects seem to have been drawn from this same group. The almost exclusive use of spolia must be the principal cause of architectural conservatism in Rome throughout the period, and almost certainly played the most important part in the decline of the architectural profession.

One of the principal themes of the thesis has been the continuity of architectural activity throughout the seventh and tenth centuries. Textual and archaeological evidence has been provided for this, principally in the form of church building. Individual churches
considered include the substantial, surviving monuments of S. Gregorio Nazianzeno and S. Tommaso in Formis, two of the most important buildings of these "dark ages", never previously recognised as such. A substantial "corpus" of churches (that is, almost forty buildings) for these two periods has now been established, based partly on a new, standardised interpretation of building expressions in the Liber Pontificalis. Very few of these churches have ever been considered in the context of early medieval architecture; any previous study has concentrated on later rebuilding phases.

The textual notices regarding work on the city walls and aqueducts by the eighth and ninth-century popes have long been known, but seldom believed - and never investigated archaeologically. The physical traces of these campaigns have now been discovered, and demonstrated for the first time. The first detailed discussion of the "Aqua Jovia" has been presented, and it has called into question one of the principal tenets of Classical Roman topography - that is, the identification of the Antoniniana and Alexandriana aqueducts.

Lastly, the enigmatic subject of housing has been tackled for the first time. I have demonstrated a far wider spread of habitation than was previously sustained, and put forward probable physical traces of this.

The emphasis on continuity, and the proposed model of the administrative system for building throughout the period, have meant that the contributions of the Carolingians, formerly considered as the most important agents of the era's architectural development, have been virtually passed over. This neglect is in fact a principal feature of my model for building in early medieval Rome: in terms of funding, administration, materials, labour and architectural typology, the city remained tied to its own traditions, and, due to the power of the Church, virtually self-sufficient.
Appendix 1: Building expressions in the Liber Pontificalis

The Liber Pontificalis is the obvious point of departure for any survey of building in early medieval Rome. Considering this, it is surprising that a straightforward study has never been made of the language of the text's building expressions. Here I propose to select those buildings which can be well-dated by sources other than the Liber Pontificalis and then consider which expression is given for their construction or conversion in the Liber Pontificalis. This should then enable us to visualise exactly what interpretation can be obtained from such expressions when there is little or no evidence from any source other than the Liber Pontificalis. These "other sources" consist of inscriptions, texts and archaeological data. Obviously our best results will come in cases where there is a substantial amount of non-Liber Pontificalis information, preferably from more than one of these sources.

Before starting, something should be said about the problem of "circular arguments": for example, a particular text tells us that a building was founded by a certain individual; the building's masonry is studied, and its type is then considered indicative of the period; another building whose chronology is in doubt (there are several rebuildings attested in the original text) is then dated due to this same masonry type; finally, the second building's masonry-attested date is used to prove the validity of the same text's attribution of a building phase to our original individual. This process of deduction occurs quite frequently with the churches of our period. However, it is not as invalid as is usually claimed. If, in our example, the fabric of the original building is clearly of one phase, and the text(s) propose only one builder, we would be safe in assigning such a masonry-type to that builder; when the type is found thereafter, we might use it to confirm diffuse textual references. Obviously, such an identification would not be as satisfactory as one arrived at from more scientific methods; but it is still valid.

Before giving the individual examples, I would first state that the characteristic masonry of late eighth/early ninth-century buildings will here be considered as an independent archaeological dating tool, to be used in this survey as a "non-Liber Pontificalis" dating source. Although it has often been dated precisely by this text, the masonry can in fact be shown to belong to this period using other means. It can be shown to be contemporaneous with in-situ inscriptions and mosaics of Leo III, Paschal I and Gregory IV at the churches of SS. Nereo & Achilleo, S. Cecilia, S. Prassede, S. Maria in Domnica and S. Marco. It also represents the earliest construction-phases of buildings whose inscriptions, although not in situ, tell us were founded in the late eighth and mid ninth centuries: S. 

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1 There are many scattered references to the interpretation of the terms in various studies of individual monuments. The most cogent comments are those of Krautheimer, which will be considered below. Geertman gives a summary of terms used in the "First version" of the Liber Pontificalis of 535 (1975, 184-191).

2 It could be claimed that the mosaic inscriptions do not themselves date the buildings in which they are placed; however, the marble inscription of Paschal I at the S. Zeno chapel of S. Prassede is bonded into the building's masonry.
Angelo in Pescheria, the walls of Cencelle and the Leonine Walls (whose foundation is also independently attested by a contemporary Frankish capitulary - LP ed. Duchesne vol. II 137 n. 46). Finally, the excavation of the domusculata at Caprarorum has furnished firm archaeological evidence for dating this same masonry type to the late eighth/early ninth century (most clearly by the stratigraphy of a subsidiary tufa building - Christie, 1991, 51ff).

In the table, an asterisk against a Liber Pontificalis term indicates a new building, a cross represents a substantial restoration, and a # symbol signifies the conversion of a pre-existing structure (all judged from the "Independent Evidence"). All references for "Independent Evidence", are given at the end of this appendix.

<table>
<thead>
<tr>
<th>Building &amp; Date</th>
<th>Independent Evidence</th>
<th>Liber Pontificalis term</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS. Cosma &amp; Damiano (526-30)</td>
<td>Mosaic-inscription of Felix IV; fourth-century masonry of structure</td>
<td>#fecit</td>
</tr>
<tr>
<td>SS. Apostoli (561-74)</td>
<td>Inscription of John III; archaeology</td>
<td>*perfecit et dedicavit</td>
</tr>
<tr>
<td>S. Lorenzo fuori le Mura (579-90)</td>
<td>Mosaic-inscription of Pelagius II; archaeology</td>
<td>*fecit a fundamento</td>
</tr>
<tr>
<td>S. Maria ad Martyres (608-15)</td>
<td>Inscription of Boniface VIII assigning dedication to Boniface IV; second-century date of monument</td>
<td>#fecit</td>
</tr>
<tr>
<td>S. Agnese fuori le Mura (625-38)</td>
<td>Mosaic-inscription of Honorius I; Notitia Ecclesiarum; masonry</td>
<td>*fecit a solo</td>
</tr>
<tr>
<td>S. Pancrazio (625-38)</td>
<td>Inscription of Honorius I; Notitia Ecclesiarum; masonry</td>
<td>*fecit a solo</td>
</tr>
<tr>
<td>S. Cyriaco (625-38)</td>
<td>Masonry; stratigraphy</td>
<td>*fecit a solo</td>
</tr>
<tr>
<td>S. Maria oratory (705-7)</td>
<td>Inscription &amp; mosaics of John VII; Grimaldi</td>
<td>*fecit</td>
</tr>
<tr>
<td>Location</td>
<td>Work Type</td>
<td>Notes</td>
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<tr>
<td>Oratory of Gregory III (731-41)</td>
<td>Inscription</td>
<td>*fecit</td>
</tr>
<tr>
<td>S. Silvestro in Capite (757-67)</td>
<td>Benedict of Soracte; inscriptions; masonry</td>
<td>*a fundamentis noviter construxit</td>
</tr>
<tr>
<td>S. Maria in Cosmedin (772-95)</td>
<td>Masonry</td>
<td>*a fundamentis aedificans/ noviter reparavit</td>
</tr>
<tr>
<td>S. Cornelia (772-95)</td>
<td>Masonry; stratigraphy</td>
<td>*a solo edificavit</td>
</tr>
<tr>
<td>S. Lorenzo in Lucina (772-95)</td>
<td>Masonry</td>
<td>+ noviter renovavit</td>
</tr>
<tr>
<td>City Walls (772-95)</td>
<td>Masonry</td>
<td>+ renovavit atque restauravit</td>
</tr>
<tr>
<td>Aqua Claudia (772-95)</td>
<td>Masonry</td>
<td>+ renovavit atque restauravit</td>
</tr>
<tr>
<td>Aqua Jovia (772-95)</td>
<td>Masonry</td>
<td>+ a fundamentis restaurare fecit</td>
</tr>
<tr>
<td>S. Apollinare roof (795-816)</td>
<td>Agnellus</td>
<td>+ noviter ac firmatur restauravit</td>
</tr>
<tr>
<td>SS. Nereo &amp; Achilleo (795-816)</td>
<td>Monogram &amp; mosaics of Leo III; masonry</td>
<td>*noviter a fundamentis construens</td>
</tr>
<tr>
<td>S. Pellegrino (795-816)</td>
<td>Masonry</td>
<td>*a novo construxit</td>
</tr>
<tr>
<td>Lateran triclinia (795-816)</td>
<td>Mosaic-inscriptions of Leo III; masonry</td>
<td>*fecit</td>
</tr>
<tr>
<td>S. Prassede (817-24)</td>
<td>Mosaic-inscription of Paschal I; masonry</td>
<td>*renovans construxerat</td>
</tr>
<tr>
<td>S. Zeno oratory (817-24)</td>
<td>Inscription &amp; mosaics of Paschal I; masonry</td>
<td>*fecit</td>
</tr>
<tr>
<td>S. Maria in Domnica (817-24)</td>
<td>Mosaic-inscription of Paschal I; masonry</td>
<td>*a fundamentis aedificans renovavit</td>
</tr>
<tr>
<td>Location</td>
<td>Description</td>
<td>Inscription Details</td>
</tr>
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<td>---------------------------</td>
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<tr>
<td>S. Cecilia (817-24)</td>
<td>Mosaic-inscription of Paschal I; masonry</td>
<td>*novam construere</td>
</tr>
<tr>
<td>S. Marco (827-44)</td>
<td>Mosaic-inscription of Gregory IV; masonry</td>
<td>*a fundamentis eiecet/fecit</td>
</tr>
<tr>
<td>S. Giorgio in Velabro; apse &amp; aisles (827-44)</td>
<td>Masonry</td>
<td>+ fecit/a fundamentis compsit</td>
</tr>
<tr>
<td>S. Martino ai Monti (844-47)</td>
<td>Inscription of Sergius II &amp; Leo IV; masonry</td>
<td>*renovans construxerat/a fundamentis perfecit</td>
</tr>
<tr>
<td>Aqua Jovia (844-47)</td>
<td>Masonry</td>
<td>+ a noviter restauravit</td>
</tr>
<tr>
<td>S. Maria Nova (847-55)</td>
<td>Masonry</td>
<td>*a fundamentis construxerat</td>
</tr>
<tr>
<td>Leonine Walls (847-55)</td>
<td>Inscriptions; Frankish capitulary; masonry</td>
<td>*constructa est</td>
</tr>
<tr>
<td>City Walls (847-55)</td>
<td>Masonry</td>
<td>+ renovare atque curavit</td>
</tr>
<tr>
<td>Cencelle Walls (847-55)</td>
<td>Inscription of Leo IV; masonry</td>
<td>*fundare et construere</td>
</tr>
<tr>
<td>S. Maria in Cosmedin Papal Palace (858-67)</td>
<td>Masonry</td>
<td>*fecit</td>
</tr>
<tr>
<td>Aqua Jovia (858-67)</td>
<td>Masonry</td>
<td>+ a fundamentis ad fabricandum atque restaurandum preparavit</td>
</tr>
<tr>
<td>S. Giovanni in Laterano (904-11)</td>
<td>John the Deacon; inscriptions of Sergius III</td>
<td>+ a solo reedificavit</td>
</tr>
</tbody>
</table>

Of the 35 examples given, we have 2 conversions, 13 restorations and 23 cases of new building (the discrepancy caused by the fact that S. Maria in Cosmedin, S. Prassede and S. Maria Domnica are said to be both restorations and new buildings; the fact that the only independent evidence for the restorations of both the Aqua Jovia and the city walls
comes from masonry type means that we should perhaps consider as "proven" only one intervention on each). For the conversions the simple term "fecit" is used. For the restorations are used "renovavit/ restauravit/ reparavit a noviter" and "re-edificavit". Of the new building cases, we have 3 oratories, 2 palace works, 2 fortifications and 16 churches. All oratories and palace works use the term "fecit". The fortifications use the verb "construere". Of the churches, those from the seventh century use the terms "fecit a fundamentis" or "fecit a solo"; thereafter is used "construxit" or "aedificavit", with or without "a fundamentis" and "a solo" (the two works of Gregory IV are something of an exception: S. Marco is "a fundamentis eiecet" [= "erexit"?]; the apse of S. Giorgio is "a fundamentis comsit").

This is of great importance to our interpretation of all other Liber Pontificalis descriptions of papal building works. From the early eighth century onwards, when such descriptions become more detailed, with a varied vocabulary of what we might call "building verbs", we can now accept "construere" and "aedificare" as new-building verbs. Problems arise when we consider the generic "facere". As seen, the verb is used for all work connected with oratories. The three listed above show by their archaeology that they were new constructions; however, it is possible that other less well researched oratories, which again are termed "fecit" in the Liber Pontificalis, were simply conversions of pre-existing buildings, or parts of buildings (cf. S. Euplos in 4.1, #1). The same goes for buildings connected with palaces. When, in all biographies prior to the eighth century, "facere" is used to describe the conversion or construction of actual churches, we are again faced with uncertainties. Krautheimer was the first to observe that in the biography of Honorius I the simple "fecit" was used for buildings known to be conversions (S. Adriano, S. Lucia in Selcis - not listed above for lack of independent textual evidence), whereas "fecit a solo" was used for archaeologically-attested new constructions (CBCR IV, 33-4). This distinction holds good also for SS. Cosma & Damiano and S. Maria ad Martyres (conversions, therefore "fecit") and S. Lorenzo fuori le Mura (a new work, hence "fecit a fundamentis"). SS. Apostoli is an exception due to its being constructed over two pontificates.

The subject of restoration is more difficult. The examples given above all have in common the fact that they have left substantial physical traces - in other words, such restorations represented more than a simple painting or re-pointing job. All cases, as noted, use the terms "restauravit/ renovavit/ reparavit a noviter/ fundamentis". Can we then assume that all such expressions in the (later) Liber Pontificalis denote large-scale works? The table's one exception of restoration which has left no trace is that of the rebuilding of the roof of S. Apollinare in Classe. This could be checked by the independent testimony of Agnellus of Ravenna, who described the project in great detail. What is interesting is that the Liber Pontificalis, too, is quite specific regarding its own description: it uses "noviter ac firmatur restauravit", but at the same time tells us that the project concerned only the roof. In other words, no grandiose claims are made regarding a complete rebuilding. Although our "proven" selection of restoration terms is only a small percentage of the total, unchecked references in the Liber Pontificalis (especially of all those listed in the biographies of Hadrian I and Leo III), the evidence collated suggests
that, unless more detail is given regarding roofing or painting, the expression "renovavit ac restauravit a fundamentis" can be taken to signify a substantial construction intervention.

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