1. Introduction

Discussion of the last century of the Roman Republic, now increasingly incisive and professional in the field of political and social history, if less so in the field of economic history\(^1\), has so far taken little account of the evidence of archaeology, or rather of those historical investigations which make direct use of material objects as their primary source of evidence; the ‘material culture’ thus studied is naturally to be understood in the widest possible sense. Of course, a concern with material culture has not been wholly lacking in historians, who are perhaps now increasingly aware of it (it is here irrelevant whether they have rejected or accepted, however summarily, its relevance, provided they have done so explicitly).\(^2\) But the use of archaeological evidence, when it has occurred, has been for the most part conditioned by a traditionalist approach, which sees in a number of fields of study no more than ancillary disciplines to the science of history; fields of study concerned with material culture have been particularly vulnerable to being ranked in this hierarchical fashion and thus to being used to provide marginal support to theories based largely or exclusively on evidence of other kinds, for the most part literary.

The most obvious critique of this methodology is one which can be directed against other targets also, namely the impropriety of using out of context data of diverse origins; for this procedure destroys the original significance of the data, which can then be made to fit almost any system and which at the same time cease to be subject to the possibility of scientific control.

Serious archaeology at the moment tends for the most part to treat archaeological evidence as sui generis, to be studied in its own right, according to its own internal rules of behaviour. This approach is undoubtedly methodologically sounder, but is still not without its dangers, notably of regarding as definitive what is only a first stage, of confusing ends with means; the danger is common to any technical activity which can be carried out in isolation. In fact, it is or ought to be obvious

Notes

*Translated by Michael H. Crawford.


\(^2\) The book by Finley, cited in n. 1, provides an example of almost total discounting of archaeological evidence.
that history is a single science, to which the different disciplines must contribute in their different ways and which in the final instance provides the ultimate criteria of assessment. Any piece of specialist research must therefore expect from the outset to have to stand up to the critiques of other disciplines, even if this is only the very last stage of all, when the various specialist methods and techniques have done their work to the full.

My approach in this article is therefore that which I have just outlined; it aims to unite, even if only provisionally, the results achieved in a number of different fields of study, traditional historiography, archaeology, philology, numismatics and so on, in the context of a single problem, building activity in the late Republic. For it is my impression that research on this problem, of which there has been a great deal, runs the risk of increasing specialisation, with its attendant danger of incomprehensibility; independent lines of research may then fail to make contact and lose the possibility of independent assessment or they may borrow only data long abandoned. The obvious consequence of this situation is that old errors are simply repeated, particularly at the level of general conclusions and particularly it seems when a particular discipline has made considerable progress within its own field of study. The subject I have chosen is in my view an ideal one in which to try out the approach which I have described.

2. _The Written Tradition_

Some further preliminary remarks are, however, necessary, on the nature of the written tradition for the period under consideration. The text of Livy of course ceases to be available with the end of Book xlv, in 167 B.C.; even Polybius, in any case of limited usefulness for the problem under discussion, does not go beyond the middle of the century. The only continuous narrative sources for the period down to the age of Ti. Gracchus are the _Periochae_ of Livy and Velleius Paterculus, with which some of the lives of Plutarch may be associated. Already in 1950, Tibiletti warned against the dangers of hasty generalisation on the basis of this inadequate documentation, of postulating, for instance, a gap in Roman colonisation between 177 and 133, with the sole exception of Auximum in 157 (in any case rejected by Salmon, who places it in 128); for if one based oneself on the _Periochae_ of Livy and on Velleius for the period before 167, one would be unaware of about half the colonies, all the viri tantas assignations and all the complements sent to existing colonies. In any case, we do not know the date of Heba, which Beloch long ago placed in the middle of the second century, and we do know that the Pompitene marshes were drained in 160, presumably with large-scale settlement as a consequence.

As far as building policy in the second century is concerned, we are in the same

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5J. Beloch, _Römische Geschichte_, Berlin and Leipzig, 1926, 608.
6Livy, _Per._ 46.
position, except that in this case the gap in our documentation where Livy ceases to be available is even more serious; for one can show for the period before 167 that our knowledge of building activity is almost wholly dependent on him. This problem of documentation has had serious consequences even for the writing of political history; Boren attempted to show some years ago that the crisis which lay behind the reforms of Ti. Gracchus was not so much an agrarian one, as the literary sources claim, but an urban one, linked to the decline in building activity in the years before 133 and to the consequent growth in unemployment of the urban plebs. It would perhaps not be worth spending much time on this hypothesis, clearly unfounded, if it had not won some acceptance from scholars such as Badian and, more cautiously, Brunt. In a recent book, Bodei Giguoni has shown the ‘modernising’, ‘Keynesian’ basis of analogous theories, attributing to the Gracchi an interventionist policy of public works, designed to reduce unemployment; but quite apart from the methodological objections to such theories, it is worth considering just how far they are justified by the evidence anyway.

A comparison between a period of about 50 years for which the full text of Livy is available (218–167 B.C., Books xxi–xliv) with one of about 100 years for which it is not available (167–68 B.C.) produces the following results. In the first period the precise date of construction or restoration is known exclusively from Livy for 22 out of 28 temples in Rome; if we look at other public buildings, the ratio is even more striking, 21 out of 22 (the exception is the Basilica Porcia, clearly a particularly well-known building); some of these buildings would be completely unknown without the text of Livy (for instance, the Emporium, the Basilica Sempronia and the Porticus Aemilia). The necessary conclusion is that almost the whole of our information on building activity in Rome comes from Livy, that is from the annalistic tradition; the literary tradition for the period after 167, twice as long as the period from 218 to 167 and for which the full text of Livy is missing, knows of only 31 public buildings, as opposed to 50 in the earlier period. The ratio, given the different lengths of the two periods is thus 1:3. But that means that in fact there is likely to have been an enormous increase in building activity after 167.

3. The Building Activity of the Censors

Let us now turn to the activities of the censors of the second century, always bearing in mind the comparison between the period before 167 and the period after:

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9Badian, Publicans, 44 and 48.
12F. Coarelli, loc. cit. in n.7.
13This fits with what we know of the difficulties faced by the aerarium during and after the Hannibalic War (Livy xxiv, 18, 2; xxvii, 10, 13; xxxiv, 6, 17).

14The repair of the Atrium Libertatis and the Villa Publica by the censors of 194 is highly significant; the buildings are closely connected with the functions of the censors and indeed contained their archives (see most recently C. Nicolet, CRAI 1976, 29–31 for the temple of the Nymphs; id., Le métier de citoyen dans la Rome républicaine, Paris, 1976, passim).

15This work on the Capitol was evidently made necessary by the landside of 192; Livy xxxv, 21, 6: ‘saxum ingens, sive imbribus seu motu terrae leniore, quam ut alioqui sentiretur, labefactatum in vicum Iugarium ex Capitolio procidit et multos oppressit’.

16The concentration on useful public buildings and the absence of ornamental or sacred buildings evidently reflects the interests and values of Cato. The moles ad Neptunias aquas (rebuilt by M. Aemilius Lepidus in 179) is evidently a terraced road, intended to bypass the ‘Pisco montano’ above Terracina. The road was eventually cut out by Trajan: G. Lugli, Forma It. I, 1, 1, Rome, 1926, n.46, cc. 210–1.

<table>
<thead>
<tr>
<th>Year</th>
<th>Censors</th>
<th>Sources</th>
<th>Building and related activities</th>
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| 169  | C. Claudius Pulcher—Ti. Sempronius Gracchus | Liv. xlv. 16, 9–11 | Walls and shops at Calatia and Auximum. Flaccus builds Capitolia of Pisauro und Fundi, aqueduct at Potentia, paved road at Pisauro, undertakes various works at Sinuessa (eubaceae, murus, forum cum tabernis et porticos, three Ion)
|      |         |         | Basilica Sempronia |
| 164  | L. Aemilius Paulus—Q. Marcus Philippus | Cic., dom. 130; Plin. NH vii. 214 | Statue of Concordia; horologium in comitio |
| 159  | P. Cornelius Nasica Corculum—M. Popillius Laena | Plin., NH vii. 215; Censor., de die natal. 23, 7; Varro, LL vi. 4; Vell., ii, 1, 2; iii, 1 | Portico on Capitol; horologium in Basilica Aemilia |
| 154  | M. Valerius Messalla—C. Cassius Longinus | Liv., Per. 48; Val. Max. ii, 4, 2; Vell. i. 15, 3; App. BC. i, 38; Oros. iv. 21, 4 | Brick theatre on slopes of Palatine. Transport of statue of Concordia into Curia |
| 147  | L. Cornelius Lentulus Lupus—L. Marcus Censorinus | Plin., NH xxxvi. 185 | Repair of temple of Jupiter Capitolinus (?); pavement in scutulatum |
| 142  | P. Cornelius Scipio Aemilianus—L. Mummius | Liv. xl. 51, 4; Plin., NH xxxiii. 57; Plut., praecl. ger. reip. 816c; Fest. 282 L.; CIL I2 626 = VI 331 | Arches of pons Aemilius; gilded lacunaria in temple of Jupiter Capitolinus; (hortae) Aemiliana (?); aedes Aemiliana Herculis; aedes Herculis victoriae |


With the building of this monument diametrically opposite the Basilica Aemilia, the Forum acquired its own architectural stamp; it is important to remember that the censors of 174 had created organic complexes for the fora of Calatia, Auximum and above all Sinuessa (we are dealing with the earliest censorial activity outside Rome).

This horologium replaced the first one, brought to Rome from Catania in 263: Pliny, loc. cit.

The story of the theatre built in 154 at the foot of the Palatine and then demolished at the orders of the consul of 155, P. Cornelius Scipio Nasica Corculum, is mentioned by several sources: evidently the political struggle involved was intense (cf. S. Mazzarino, Il pensiero storico classico, II, Bari, 1966, 301–5).

Pliny NH xxxvi, 185: 'Romae scutulatum in Iovis capitolina aede primum factum est post tertium bellum Punicum initium (147 B.C.).' On the interpretation of scutulatum as a pavement of coloured blocks so arranged as to form a pattern in perspective, cf. E. Rizzo, La Casa dei Grifi (Mon. Pittura Antica III, 1), 1936, 287; M. De Vos, BVAB I (1975) 200 (to his list add the unpublished pavement in the exedra of the Basilica of Lucus Feroniae, certainly belonging to the earliest, probably Sullan, phase of the building. All known examples belong either side of 100 B.C.

We know of the arches of the Pons Aemilius only from a reference forward by Livy from the census of 179. The gilding of the lacunaria may indicate a continuation of the work on the Temple of
Jupiter, begun already in 147 (cf. n.22; the censors of 179 also restored this temple). Both the temples of Hercules, that dedicated by Scipio Aemilianus (see F. Coarelli, Guida archeologica di Roma, Rome, 1975, 279, and Appendix 1 below), and that dedicated by L. Mummius were only dedicated in 142: clearly they have nothing to do with the locatio censoria. The placing of a fragment of the Forma Urbis with AEMILIA[ANA] (cf. E. Rodríguez-Almeida, BCAR lxxii (1975) 112–3) makes it very likely that this building, presumably the (Horrea) Aemiliana, is to be placed by the river near the temple of Portunus, where in fact the remains have been discovered of large horrea rebuilt under the Empire (see the forthcoming publication of A. M. Colini and C. Buzzetti, in BCAR). In fact we know from a lost inscription (CIL XV, 7150) that this building was near the river and from Varro (de re r. iii, 2, 6) that it was outside Porta Flumentana, also to be placed near the temple of Portunus (R. E. A. Palmer, forthcoming in BCAR; F. Coarelli, Guida 22, 286).

24But see p. 8 below for an argument against this gap in building activity.
26The activity of these censors could also be explained in terms of laws which regulated building practice; see for instance the limitation on renting (Vell. ii, 10, 1) and on the height of buildings (Val. Max. viii, i, 7). Their activity is known only from the building of an aqueduct of which Frontinus and Pliny speak. No historical sources (not even the Periochea of Livy) mention it.
27The temple of Castor, burnt in 117, may be the work of Diadematus, for we know that it was restored by a Metellus. In any case two years are perhaps too little for the rebuilding.
PUBLIC BUILDING IN ROME

For eight colleges of censors, over the thirty years from 199 to 169, we hear of the construction or repair of at least 34 buildings in Rome (including large complexes, such as Iatius to be faced, road systems to be paved, and so on). For sixteen colleges of censors, over the eighty years from 169 to 85 (the last census before the Sullan period), we hear of only nine items, including statues, horologia and the pavements of temples; either of the two censuses of 179 or 174 alone accounts for a larger number. Even if it is true that the importance of the censorship, in building as in its other activities, becomes progressively less from the beginning of the first century onwards, and finally becomes redundant with Sulla, it is impossible to suppose that the apparent decline in building activity after 167 and above all after 150 is not the consequence of the poverty of the literary tradition for this period and in particular of the loss of the full text of Livy.

4. The Numismatic Evidence

Some confirmation of this view and an alternative source of evidence to fill the gap at any rate in part may perhaps be drawn from the numismatic evidence and in particular from the analysis by M. Crawford of the volume of the issues of the Roman Republic in the second and early first centuries B.C. Particularly important is the evidence for substantial issues in the period 138 to 136 and for chronic shortage of coinage in the years after the Social War, down to 63; the first point raises serious doubts about the view of Boren that there was recession and stagnation in Rome in the years immediately before the tribunate of Ti. Gracchus, while the second point contrasts strikingly with the widely held view that there was a burst of public activity in the years after the victory of Sulla. In fact the evidence for the Sullan period is not such as to provide any confirmation of this view; apart from the major undertaking, the reconstruction of the buildings on the Capitol by Q. Lutatius Catulus after the fire of 83, we know only of works in the Comitium, closely connected with the Sullan reform of the Roman political system and its legal organs, and of repairs to certain temples. That in this case the picture is not the result of inadequate documentation is suggested by the fact that the work on the Capitol is known to have proceeded very slowly, being still unfinished in 69; this hardly suggests intense public building activity.

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29 M. Crawford, Roman Republican Consular, Cambridge 1974, 533-707, Fig. 58.
30 Cf. art. cit. in n. 8.
34 See Appendix 1. Cf Gros, op. cit. in n. 32.
35 The dedication took place this year, but the work was not finished, if it is true that the cult statue of Apollo was only put out to contract in 65 and finished in 63 (Cic. de nat. ii. 46; in Cat. iii, 29; Cass. Dio 37, 34, 3-4; Chalcid., ad Plac., Tim., p. 440 Meurs).
Table 58 in Crawford, with its comparison between volume of issues and military expenses, provides an overall view of the finances of the Roman state in the period with which we are concerned; the two curves are in general close, except for certain points where volume of issue markedly exceeds military expenditure (the opposite occurrence, in any case rare, does not concern us here). The most considerable surplus occurs in the years 138–136, but there are also considerable surpluses for 125–124, 115–114, 110–108, 91–89. The enormous issues of the years 91–89 are obviously the result of the need to finance the Social War. As far as the other cases are concerned, I have already noted that they seem to coincide with censuses, that of 138–136 with the census of 136, that of 125–124 with the census of 125, that of 110–108 with the censuses of 109 and 108. One may then hypothesise that the extra volume of coinage issued was used, at least in part, for public building; it is noticeable that the largest surplus of all is precisely that of 136, a census year, for which no other record of building activity survives, while in two other cases one can show that expensive building activity was undertaken, in 125 the building of the aqua Tepula, in 109 the building of the Via Aemilia Scauri. It would be reasonable to argue by analogy that the census of 136 was a heavy-spending one, in a field which can only be that of public building.

If we now reconsider the article of Boren, we find the outright assertion that from 138 to 125 (from the building of the temple of Mars in Circo to that of the aqua Tepula) no building of any importance was erected in Rome. Even on the basis of the literary documentation which we do possess the assertion is inaccurate; the temple of Mars, built by the Greek architect Hermodorus of Salamis, was certainly built from 132 onwards, the date of the triumph of D. Brutus Callaius, not from 138, the date of his consulship. Furthermore, in this very year, 132, a temple of Virtus was begun, vowed by P. Scipio Aemilianus in the course of the war against Numantia. The absence of employment for the Roman plebs was thus not as complete as Boren asserts. And one must add that there were undoubtedly many other buildings then being constructed of which no record remains, for instance, the round temple in the Forum Boarium, recently published by Rakob and Heilmeyer and dated by them to 100 or soon after, but in my view to be dated 30 years or so earlier. The gap between 132 and 125 is not in any case remarkable; for the period from 167 to the Social War we have one gap of five years from 159 to 154, one of seven from 154 to 147, one of ten from 142 to 132, one of eight from 98 to 90 (see Appendix 1). That these gaps are in general the result of the state of our documentation is obvious from the fact that for the period from 199 to 167 one hardly ever finds gaps of more than

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37 As Crawford notes, loc. cit.
38 Also noted by Crawford, ibid.
39 Crawford, ibid., has emphasised the possible use of the money for public building in these two cases.
41 Cf. Appendix I.
42 Op. cit. in n.32.
43 Cf. my review (n.32).
one or two years (there is one of four, between 178 and 174). In fact, speculations such as those of Boren are of no use and the ‘urban side’ of the Gracchan crisis, at any rate as far as public spending is concerned, can be quietly set aside. It remains to examine private building activity, on which the literary sources are obviously less informative, but which (to judge at any rate from the archaeological evidence, despite the absence of a systematic study) seems to have been extensive at least from the middle of the second century onwards. But of that more later.

5. Architectural Structures and Building Techniques

In archaeology, as in history, there is a ‘myth of Sulla’, which it is in my view worth exposing. As Pierre Gros has recently pointed out,\(^4^4\) it is curious that the so-called Sullan phase of Roman architecture is for archaeologists the years after the death of Sulla, that is the second quarter of the first century B.C. The whole of the recent discussion of so-called Italian architecture, for instance on the date of the sanctuary of Praeneste, takes its starting point more or less directly from this view. There is no good argument for dating the monument to the years after 82, while the magisterial work of Degrassi\(^4^5\) has shown that the building is earlier than the civil war of the 80s B.C. But myths survive by their own impetus. If we investigate the earlier stages of this particular discussion, we shall find only one argument for the late dating of the sanctuary at Praeneste, the building technique used, cement work with a facing in opus incertum. When at the beginning of the century Delbrück wrote Hellenistische Bauten in Latium,\(^4^6\) which remains the standard work on Republican architecture, opus incertum was dated in the age of Sulla. We now know that it goes back much earlier, to the beginning of the second century B.C.\(^4^7\) The identification of the Porticus Aemilia with the large building in Via Marmorata, which appears on the Severan plan,\(^4^8\) was made originally by Guglielmo Gatti; it has sometimes been doubted, even recently, with the intention among others of re-opening the discussion over the high dating of opus incertum.\(^4^9\) But even if the identification were disproved, which seems to me unlikely, one would not in any case re-open the discussion of the chronology of the building techniques of the last two centuries of the Republic, which now depends on a whole series of securely dated monuments. It therefore seems useful to present here a list of identified and dated Roman monuments (see Appendix 2), which can be placed beside the list of those mentioned in the literary sources (see above). These two series of pieces of evidence complete and confirm each other, so as to form a system whose validity is assured by its coherence.


\(^{4^8}\)*G. Gatti, *BCAR* lxxii (1934) 123–41.

\(^{4^9}\)*See the articles of v. Gerkan and Richardson (n.47).
It is in any case above all necessary to arrive at a rigorous definition of the terms used. For this, the modern scholar has the good fortune to know the ancient terminology, transmitted by Vitruvius (ii, 8, 1):

'Structurarum genera sunt haec: reticulatum quo nunc omnes utuntur, et antiquum quod incertum dicitur. Ex his venustius est reticulatum, sed ad rimas faciendias ideo paratum, quod in omnes partes dissoluta habet cubilia et coagamenta. Incerta vero caementa alia super alia sedentia inter seque inbricata non speciosam sed firmiorem quam reticulata praestant structuram.'

The description coincides perfectly with the building techniques actually attested and allows us to adopt a very precise terminology. Vitruvius knows only two kinds of facing, reticulatum and incertum, while in the modern literature a third has emerged, quasi reticulatum, for an intermediate phase. The procedure is arbitrary, but useful; it could, however, be infinitely extended, with the introduction of other typological criteria, based on the greater or lesser regularity of the elements making up the facing. For Vitruvius the notion of quasi reticulatum is obviously subsumed in that of reticulatum, which is in fact perfectly rational, since the real qualitative change is between incertum and quasi reticulatum, as we shall see. Another advantage of abandoning the notion of quasi reticulatum would be the elimination of a certain amount of terminological confusion, since often the same facing is differently classified by different scholars, as quasi reticulatum or reticulatum, for instance. In any case the suggestion of von Gerkan to introduce the notion of pseudo reticulatum must be rejected (it includes high quality incertum, as in the Porticus Aemilia, and quasi reticulatum). It is clear that the aim of this terminology is to move down, perhaps to Sulla, obviously early buildings. It emerges from the description of Vitruvius that the notion of incertum includes the pseudo reticulatum of von Gerkan.

For the factor which distinguishes the two techniques one must go back to the description of Vitruvius, who insists on the relative separateness of the elements of the facing in reticulatum, which results from the greater regularity of their shape, square or squared, and therefore from the regularity of the joints, which become straight and continuous (Fig. 1, a-i). It is therefore precisely the course of the joints which constitutes the factor distinguishing the two techniques.

To distinguish the various intermediate phases between these two basic types, rather than multiply and define subdivisions, it is better to use drawings, which I hope will help to avoid the misunderstandings which have been common hitherto.

One of the first monuments built in Rome after the end of the Second Punic War is the temple of the Magna Mater on the Palatine. The image from Pessinus reached the city during the war already in 205, but building work only began later; the temple was vowed in 204, but dedicated only in 191, the slow progress being the result of the financial difficulties recorded by Livy. The monument, long identified

\[\text{\footnotesize\textsuperscript{69}}\text{v. Gerkan, art. cit., 191f. This terminology has been accepted, for instance, by Kähler in the course of his misguided attempt to date to the age of Sulla the viaduct behind the imperial Rostra (H. Kähler, \textit{Das Fünfhundertdenkmal für die Tetrarchen auf dem Forum Romanum}, Köln, 1964, 19f.).}\]

\[\text{\footnotesize\textsuperscript{31}}\text{Apart from the manuals, see above all Chr. Hülsen, \textit{Der Tempel der Magna Mater}, \textit{MDAI(R)} (1895) 3-37; P. Romanelli, \textit{Lo scavo del Tempio della Magna Mater sul Palatino}, \textit{Monum. Lincei} xlvii (1963) cc. 202-330; Gwyn Morgan, \textit{Villa Publica and Magna Mater}, art. cit.}\]

\[\text{\footnotesize\textsuperscript{32}}\text{Cf. n.13.}\]
FIG. 1

a. Temple of Magna Mater, Phase 1, 204–191 B.C.
b. Foundations of Capitolium, 189 B.C.
c. Porticus Aemilia, 174 B.C.
d. Viaduct in Forum, 174 B.C.
e. Porticus Metelli, 146 B.C.
f. Lacus Iuturnae, 116 B.C.
g. Horrea Galbana, 110–100 B.C.
h. House of the Gryphons, c. 100 B.C.
i. Theatre of Pompeius, 60 B.C.

(The drawings are not to scale)
with the remains at the south-west corner of the Palatine, has often been studied and has recently been excavated down to the lowest levels.\textsuperscript{53} Three clearly distinct phases emerge: the earliest in \textit{opus incertum} of tufa of Grotta Oscura and pepperino (Plate Ia and Fig. 1, a), the second in \textit{opus quasi reticulatum} (to use the traditional terminology) of tufa of the Anio, and a third to which belong for the most part the surviving remains.\textsuperscript{54} All this fits excellently the evidence of the literary sources, according to which the original temple was twice rebuilt after fires, the first time after 111 B.C., by a Metellus (perhaps C. Metellus Caprarius; the inauguration probably took place in 102 when Q. Metellus Numidicus and C. Metellus Caprarius were censors\textsuperscript{55}), the second time by Augustus after the fire of A.D. 3.\textsuperscript{56} These three phases correspond to the three revealed by excavation; it is important also to notice that the elements which belong to the earliest surviving building phase rest directly on the rock. Despite this fact, the excavator reached the paradoxical conclusions that the earliest phase, in \textit{opus incertum}, corresponded to the restoration after 111, that in \textit{opus quasi reticulatum} to the Augustan restoration, while the original building had disappeared without leaving any trace at all.\textsuperscript{57} This curious conclusion is based, not, as one might suppose, on stratigraphical evidence, since the excavated material confirms, as far as one can judge from the publication, the chronology which I have suggested;\textsuperscript{58} the only argument is one which it is worth quoting in full:

‘Non si puo pensare che al principio del II secolo av. Cr. un tempio della importanza di questo, sul Palatino, venisse costruito non piu in opera quadrata di pietra (tufo o peperino) ma in opera incerta: l’uso di questa comincia invero proprio in tale periodo, ma i primi edifici che ce ne fanno sicura testimonianza sono, finora almeno, edifici non di carattere sacro: la porticus Aemilia del 174, il portico di Metello del 147; ed altri ricordati dal Lugli.’\textsuperscript{59}

There can few better examples of arbitrary reasoning: it is regarded as impossible that a temple built at the beginning of the second century B.C. on the Palatine could be built in \textit{opus incertum}, despite the existence of the technique in the period; one excavates and finds evidence to refute the earlier premise; but this is simply repeated. One wonders why the excavation was ever undertaken.

In fact, the existence of a temple with \textit{podium} in cement work covered with \textit{opus incertum} is not only possible at the beginning of the second century B.C.;\textsuperscript{60} the emergence of the technique fits perfectly the historical context. We have already had

\textsuperscript{53}Romanelli, art. cit.
\textsuperscript{54}W. D. Heilmeyer, \textit{Korintische Normalkapelle}, Heidelberg. 1970. 122; P. Gros, \textit{Aurea Tempia}.
\textsuperscript{55}Gwyn Morgan, ‘Villa Publica and Magna Mater’, art. cit.
\textsuperscript{56}Gros, \textit{Aurea Tempia}, op. cit., 15, 19.
\textsuperscript{57}Romanelli, art. cit., cc. 227–39.
\textsuperscript{58}On this material and in particular on the whole temple, a publication is being prepared by the Seminar of the Istituto di Archeologia e Storia dell’Arte Greca e Romana dell’Universita di Roma, under the direction of P. Pensabene.
\textsuperscript{59}P. Romanelli, art. cit., c. 232.
\textsuperscript{60}One must mention at least the cement work podium of Temple D in Largo Argentina, whose first phase certainly belongs in the second century, and which is probably to be identified with the Temple of the Lares Pernarini, built between 190 and 179 (cf. F. Coarelli, ‘L’identificazione dell’Area sacra dell’Argentina’, \textit{Palatino} xii, 4 (1968) 365–73; \textit{Guida archeologica di Roma}, cit., 253).
occasion to notice the financial difficulties of Rome at the end of the Second Punic War, confirmed by the inactivity of the censors of 199 B.C. in the field of public building and the time taken to build the temple of the Magna Mater, thirteen years, as Livy emphasises.61 But the very technique used, cement work, can be explained precisely by the shortage of finance at the time. And the appearance of the opus incertum, the first dated example in Rome, confirms the argument: it is composed of a series of superimposed layers, about a metre high, made up alternately of pieces of peperino and of tufa of Grotta Oscura (Plate Ia), very roughly shaped, bonded by a grey mortar, very friable and coarse.62 We have clearly one of the earliest attempts to cover a cement work core with a facing, a facing which is at this stage hard to distinguish from the aggregate of the core. The alternation of two different materials in the facing is also unparalleled, and gives the impression of a technique at its earliest, experimental stage. To date this construction to the last decade of the second century B.C., at the moment of transition from opus incertum to opus reticulatum, is almost impossible. But if we recognise in this podium, following Hülsen at the beginning of the century,63 the earliest phase of the temple, the first restoration can be identified with the work in opus quasi reticulatum in tufa of the Anio; the years between 111 and 102 are perfectly acceptable for this technique. It is important to note that the walling at the foundations is in opus incertum, still of tufa of the Anio; this mixed technique, incertum at the foundations, quasi reticulatum at the upper levels, seems characteristic of a period of transition and recurs in Temple B of the Largo Argentina, datable to the years after 101 B.C. and thus contemporary with the second phase of the temple of the Magna Mater.64

In 189 B.C. the censors L. Quinctius Flamininus and M. Claudius Marcellus 'substructionem super Aequimelium in Capitolio . . . locaverunt.'65 This building work, probably made necessary by the collapse of the slope of the hill in 192 B.C.,66 has perhaps left a visible trace; in 1940, at the level of the Piazza della Consolazione (where the Aequimaelium is certainly to be located67), there were discovered substantial remains of the terracing of the slope, partly in opus quadratum of tufa, partly in opus incertum of tufa of Grotta Oscura and Monteverde68 (Plate Ib, Fig. 1, b). We are clearly dealing with early structures, as emerges from the absence of tufa of the Anio and from the nature of the opus incertum, with small and irregular facing pieces.

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61Livy xxxvi, 36, 4: 'tredecim annis postquam locata erat dedicavit eam M. Iunius Brutus'.
62On the types of mortar in use under the Republic see the classic article of E. B. van Deman, ‘Methods of Determining the Date of Roman Concrete Monuments’, AJA xvi (1912) 230-51.
63Art. cit. (n.51).
64G. Marchetti-Longhi, BCAR lxvi (1956-8) 45-118.
65Livy xxxviii, 28, 3.
66Cf. n.15.
68BCAR lxviii (1940) 228: ‘Queste costruzioni sorgevano nell’area tra il piede del colle e il vicus lagarius, su cui si allineavano: la roccia è apparsa ovunque da esse regolata e rivestita, ma in due tratti, e cioè presso la facciata della chiesa della Consolazione e di fronte all’ingresso dell’ospedale omonimo, restano notevoli avanzi delle opere di sostruzione del colle eseguite nei punti deboli e frastorni durante la Repubblica’. Cf. Capitolium xviii, 1 (1943) 98; Lugli, La tecnica edilitza, op. cit., 412; Capitolium xl, 4 (1965) plate on p. 179 (plan).
and grey mortar. The technique is however already more developed than in the case of the temple of the Magna Mater, some 10–15 years earlier.

To the activity of the censors of 174 we can attribute the viaduct with arches behind the Rostra (Plate Id, Fig. 1, d), as Lugli saw, identifying it with the 'porticum ab aedae Saturni in Capitolium [et] ad senaculum ac super id [ad] curiam' mentioned by Livy. The early Republican date of this monument is assured by the fact that it was rendered unusable by the semicircular structure behind the Augustan Rostra, certainly Caesarian in date, despite a recent attempt to date it to the age of Diocletian. The type of opus incertum used is a little more advanced than that on the slopes of the Capitol, with larger and better-fitted facing pieces, but still in tufa of Grotta Oscura and Monteverde. It is interesting to note that this type of walling is almost identical with that of the Porticus Aemilia, whose high date, recently doubted, and hence identification are both thus confirmed (Plate Ir, Fig. 1, c).

We should also notice the remains of walls in opus incertum of the Porticus Metelli, datable to the years after 146 (Fig. 1, e) and the foundations of Temple B in Largo Argentina, already mentioned (Plate III), of about 100 B.C. (while the upper part of the cella, as already mentioned, is in opus reticulatum). The move from opus incertum to opus reticulatum thus belongs in the closing decades of the second century b.c.: apart from Temple B in the Largo Argentina and the second phase of the temple of the Magna Mater, one may cite the Lacus Iuturnae (Plate II, Fig. 1, f), of which the visible remains are certainly Republican, as appears from the level at which it is built. It is probable that the reconstruction in the form of a luxurious nymphaeum, with the statues of the Dioscuri, is connected with the rebuilding of the nearby Temple of the Dioscuri after the fire of 117 B.C. by Metellus Dalmaticus. The type of facing in opus reticulatum of Grotta Oscura fits this dating perfectly.

Private houses also provide important dating evidence, notably the House of the Gryphons on the Palatine, where the recent removal of the well-known paintings of early Second Style has shown that they belong not to the first phase of the house with walls in opus incertum, as used to be believed, but to a reconstruction with walls in opus quasi reticulatum, already almost regular (Fig. 1, h). The dating of these paintings to the first years of the first century B.C. (if not earlier) provides clear

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69 Livy xii, 27. 7. On this passage, apart from the commentary of Jal, and the article of W. Richter, cited in n. 18, see A. Klotz, *RE*, II A, 2, cc. 1453–4 (Senaculum); A. Schlesinger, ed. Loeb, comm. ad loc.; F. Coarelli, 'Il Comizio', art. cit. (n. 34).
72 Marchetti-Longhi, art. cit. (n. 64), 62, fig. 11, pl. III.
73 Coarelli, *Hellenismus in Mittelitalien*, 27.
74 Cf. Appendix 2, and supra, the list of censual buildings.
confirmation of the beginning of the use of *opus reticulatum* already at that date and of the use of *opus incertum*, even for private houses, even earlier. A house on the Aventine, with remains of paintings of the First Style and hence no later than the last years of the second century b.c., is built in *opus quasi reticulatum*. Furthermore, some other houses on the Palatine, demolished in the course of the building of the Augustan complex towards 36 b.c., are built in a perfectly regular *reticulatum*, which, to judge from the remains associated with it, belongs at the latest to the middle decades of the first century b.c. 79

But the most notable example of early use of *opus reticulatum* is rather a public building, the Horrea Galbana. 80 This enormous complex, built in the last decade of the second century b.c., as is shown by the nearby presence of the tomb of its likely builder, Ser. Sulpicius Galba, Cos. 108 b.c., 81 is entirely built in irregular *opus reticulatum*, of a type very close to that in the contemporary House of the Gryphons (Fig. 1, g).

A stretch of re-building of the 'Servian' walls near the Porta Viminalis, 82 in *opus reticulatum* with large facing pieces of tufa of the Anio and Grotta Oscura, can be very plausibly attributed, as has already been seen, to the Marian activity in 87 b.c., recorded by Appian. 83

The monument normally cited as the first example of *opus reticulatum* is the Theatre of Pompeius, dated to 55 b.c. (though this is the date of the inauguration and the foundations surely belong to the years immediately after 61 b.c., when the work began). 84 We now have a technique which uses very regular facing pieces and certainly already has a long tradition behind it. A contemporary example in the private sector is the Horti Luculliani, whose remains have recently been identified as the southern part of the *collis hortularum*. 85 All the walls have a covering of *opus reticulatum* with very large facing pieces, similar to those used in the above-mentioned repair of the 'Servian' walls; but we find here the novel use of courses of tiles (*opus mixtum*), common in later Republican buildings, 86 clearly to avoid the danger mentioned by Vitruvius 87 of collapse along the lines of the diagonals. The dating of the villa of Lucullus soon after 63, thus immediately before the Theatre of Pompeius, is secure. 88

78 Coarelli, *Guida archeologica di Roma*, 301.
79 Morricone Matini, op. cit., 6, 43-4 (Domus Antonii).
81 Platten-Ashby, op. cit., 480; Nash, op. cit. II, 370.
83 App., *BC* i, 66, 303 (with commentary of E. Gabba).
86 The use of *texta* is recorded several times by Vitruvius as normal in the late Republic and the age of Augustus. Some dated examples are known, for instance, at Pompeii (Small theatre and Forum baths: M. and A. De Vos, E. La Rocca, *Guida archeologica di Pompei*, Milan, 1976, 132, 155f.), at Caesarea (W. Johansson, *BA* xlii (1961) 260-3); at Terracina (G. Lugli, *Forma Italiae*, cit., c. 183, n.8; c. 186, n.12); and at Rome, above all in tombs. Nash II, 341, 357 etc.
87 Vitru. ii, 8, 1.
88 Plut., *Lucul*. 39; Tac., *Ann*., xi, 1; Platten-Ashby, 268f.; Kaster, art. cit. (n.83). The villa must have been built straight after the triumph over Mithridates of 63. It had been finished for some time by the death of Lucullus in 56.
To sum up, one can be quite certain that the use of cement work with a facing in opus incertum was introduced to Rome in the years immediately after the Second Punic War, if not earlier; we know at least four examples dated between about 200 and 146 B.C., leaving out of account the Porticus Aemilia. This chronology is confirmed by such evidence as there is of private buildings. The move to the technique of opus reticulatum (in its earliest form, the so-called opus quasi reticulatum) occurs in the last decades of the second century B.C. (with examples datable soon after 117, 111 and 101 B.C. and at least one private building of the same period, with First Style painting) (see Appendix 2). The fact that already in the last decade of the second century B.C. there appear facings which can be regarded rather as irregular opus reticulatum than as opus quasi reticulatum shows on the one hand the rapidity of the evolution and perfection of the technique, on the other hand it could perhaps be taken as an indication that opus quasi reticulatum begins a bit earlier than the first surviving dated examples. If one looks at the chronological evidence for the structures which survive, one realises that those which are most securely dated are in opus incertum, because of the availability of the evidence of Livy; once again the poor documentation for the period when his text is not available is evident. In fact we have no certainly dated monument between 174 and the last decade of the second century B.C., apart from the famous Porticus Metelli; as in other fields, the worst documented period of Republican history is the age of the Gracchi.

If we bear in mind all these considerations, and also the volume of coinage around 136 B.C., which is to be explained at least in part by the building activity of the censors of that year, it seems reasonable to suggest that the passage from opus incertum to opus reticulatum in its earliest form occurred precisely in the Gracchian period. It is in any case certain that the new technique was in use in the last decade of the second century B.C.\(^8^9\)

This long discussion is more important than might appear at first sight. The development in technique is certainly not the result, as is often asserted,\(^9^0\) of aesthetic considerations, since the facing pieces were for the most part invisible beneath a layer of plaster; nor can one think in terms of a technical improvement in the direction of greater strength, for opus incertum was in fact stronger, as Vitruvius explicitly remarks.\(^9^1\) A satisfactory explanation emerges if we bear in mind the important observation that the new technique is a Roman development. We see in fact that in Campania, which is certainly the place of origin of cement work, opus reticulatum is introduced very late, certainly from Latium, and with some difficulty: the phenomenon is very clear at Pompeii, where opus incertum was used down to the settlement of the Sullan colony.\(^9^2\) We may conclude that the change of technique is the result of needs which manifested themselves at Rome in the second half of the second century B.C. It is well known that this is a period of growth in population, mentioned explicitly by the literary

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\(^8^9\) I discuss here only the city of Rome, with the opus reticulatum of which that of central Italy should not be confused; there the stone used for the facing is much harder and the result much less regular.

\(^9^0\) Lugli, La tecnica edilizia, 488ff.

\(^9^1\) Cf. n.97.

\(^9^2\) W. Johannowsky, Hellenismus in Mittelitalien, 272; De Vos-La Rocca, Guida archeologica di Pompei, 40.
sources and deducible on other grounds; a passage of Vitruvius describes with admirable clarity the effect of this growth in population on private building:

`In ea autem maiestate urbis et civium infinita frequentia innumerabiles habitationes opus est explicare. Ergo cum recipere non possit area planata tantam multitudinem ad habitandum in urbe, ad auxilium altitudinis aedificiorum res ipsa coegit devenire. Itaque pilis lapideis, structuris testaceis, parietibus caementicis altitudes extractae contignationibus crebris coaetae cenaculorum ad summas utilitates pericient despectationes. Ergo moenibus e contignationibus variis alto spatio multiplicatis populus Romanus egregias habet sine impeditione habitationes.`

This situation had already obtained for some time by the date of Vitruvius: the existence of private buildings of several stories is attested by Livy already in 218, by Varro and above all by Cicero who already in 63 characterises Rome as *cenaculis sublatam atque suspensam*. The rise in the price of land in Rome and other well-known economic phenomena, connected with urban development, must have led at Rome to intensive speculative building, well exemplified by the activity (by no means unique) of Crassus. There must have been at the same time developing legislation to limit abuses, such as the excessive height of blocks of flats, legislation of which some mention survives.

There is indirect evidence of the growth of population at Rome in the construction of two new aqueducts in the years after 144 B.C. and 125 B.C., the *aqua Marcia* and the *aqua Tepula*. The *aqua Marcia* is the largest before the time of Claudius and the most expensive building project recorded under the Republic. While it was being built, provision was made for the restoration of two earlier aqueducts; the reasons for all this again emerge with perfect clarity from the ancient sources, with Frontinus remarking:

`et quoniam incrementum urbis exigere videbatur ampliorum modum aquae, eodem mandatum a senatu est, ut curaret, quatenus alias aquas quas posset in urbem peruceret.`

The building of the *aqua Marcia* is explicitly linked with the growth of the city and the urgency with which it was undertaken is not only recorded from Frontinus, but may be inferred from the fact that the oversight of the work was entrusted, quite exceptionally for the Republic, to a praetor. According to Frank, the enormous cost of the undertaking was covered by the booty from Corinth and Carthage. In any case, the enormous quantities of raw materials needed led to the openings of the new tufa quarries of the Anio and of *lapis Gabinus*, which then became the standard

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93 Vitri. ii, 8, 17.
94 Livy. xxi, 62, 3 (218 B.C.); xxxix, 14, 12 (186 B.C.).
95 Varro, LL v. 162.
96 Cic., de lege agr. ii, 96. Note the contrast with Capua.
100Front., ibid.
101 E. De Ruggero, Lo stato e le opere pubbliche in Roma antica, Turin, 1925, 70.
102 Frank, op. cit., 226.
building stones of the city (just as the building of the walls of the city in the early fourth century B.C. had led to the extensive exploitation of the quarries of Grotta Oscura). Soon after the opening of the quarries of the Anio begins the use of the travertine quarries for building purposes. It is obvious that the massive use of these raw materials, which will last down to the Empire and which begins in the third quarter of the second century B.C., can only be explained by supposing particularly intensive building activity in these years, precisely at the moment, that is, of the passage from opus incertum to opus reticulatum. It seems reasonable, therefore, to arrive at the conclusion that the change of technique is to be explained in terms of a sort of ‘industrialisation’ of building techniques during these years, an industrialisation perhaps more related to the upsurge in private building, which we have noticed, than to that in public building. Vitruvius, in fact, in the passage cited above, links the use of the new techniques closely with the construction of buildings with many stories; it was the impossibility of getting more than two floors with a simple brick construction (evidently the commonest technique for poor quality buildings before the second century B.C.) that determined the introduction of pilae lapideae, structurae testaceae and parietes caementiciae. This also helps to explain the relative rarity of datable buildings in cement work: public buildings were more often built in the more expensive opus quadratum, while private buildings have largely disappeared beneath the more recent constructions of Imperial date or indeed lie under the buildings of modern Rome; and private buildings, where they do survive, are difficult to date in the absence of meticulous excavation.

The study of building techniques therefore leads to the conclusion already reached on other grounds, namely that the age of the Gracchi and the immediately following years were not a period of crisis, but of extraordinary activity, linked with the social and economic transformation of Italy in the same period. The introduction of cement work at the beginning of the second century or earlier and its progressive improvement during the years which followed were a functional reaction to the transformation, in the sense that the pressure for quantity created by the new demands of society led to a qualitative change, to the use of more economical and expeditious techniques and at the same time to the use of a larger and less skilled work-force, which in turn made necessary technical modifications in methods of building. The use of opus reticulatum, which cannot be explained in purely technical, or in aesthetic terms, can thus be explained in terms of the need to use more regular and standardised components, perhaps produced in the quarries, and by a work-force different from that which employed them on the building-project. With the change in the method of production goes a certain division of labour, which is in turn linked to the increase in the labour force, with the introduction of large numbers of slaves.

104 For travertine, Frank, 'Roman Building', cit., 32–3.
106 Vitr. ii, 8, 17.
It is clear that we are dealing with a profound change, which affects the rest of Italy as well as Rome; a full examination of the entire body of epigraphical and archaeological evidence would certainly lead to the same conclusion. The discussion of the date of the sanctuary of Praeneste thus ceases to be a mere dispute over chronology and becomes a major historical issue. Another Sullan colony, Pompeii, provides furthermore clear evidence relating to the problem and demonstrates the suddenness of the explosion of public and private building activity in the last thirty years of the second century B.C.\textsuperscript{108} It is impossible here to document the entire process, on some aspects of which there has been recent work;\textsuperscript{109} but it is worth emphasising the geographical spread of the phenomenon which I have been discussing, to provide a proper context for the development of building activity in Rome. For what we are witnessing is the effects of the participation of the Italians in the plundering of the empire, the same Italians who will shortly go to war with Rome for the right to participate directly in imperial policy-making.\textsuperscript{110}

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\textsuperscript{107}See the comment of M. Torelli on the paper of Rakob, \textit{Hellenismus in Mittelitalien}, 376f.


\textsuperscript{109}Gros, \textit{Architecture et société à Rome et en Italie}, cit., provides a complete list. For the period after the Social War, E. Gabba, ‘Urbanizzazione e rinnovamenti urbanistici nell’Italia centromeridionale del I sec. a.C.’, \textit{SCO} xxi (1972) 73–112.

a Temple of Magna Mater. Podium of Phase 1
b Foundations of Capitolium. Detail
   (Via Della Consolazione)
c Porticus Aemilia. Detail
d Viaduct in Forum. Arcade
   (The upper left-hand corner is modern)
Lacus Futurnae (The upper left-hand corner of the podium is a restoration of the Augustan age, in Tufa of the Anio area)
Largo Argentina Temple B. Foundations of *cella* and image