Colonial landscapes : demography, settlement organization and impact of colonies founded by Rome (4th-2nd centuries BC)

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Chapter 2.

THE DEMOGRAPHIC LANDSCAPE

1. Introduction

Livy makes the point that the foundation of a Roman colony was a large-scale enterprise which involved the migration of thousands of people; the majority recruited from among the poor who were being offered a new, more promising existence. Livy's description of the Roman colonization programme is largely framed from an administrative perspective, as a series of political decisions about when and where colonies were founded; sometimes supplemented with the number of colonists who were entitled to participate, the amount of land they were granted and the commissioners who supervised the event. The sober, factual style adopted by Livy imbues the colonial accounts with a certain authority; it suggests that the information was derived from some sort of official chronicle.[78] In fact, most scholars have accepted the information transmitted as genuine.[79]

Recently though, doubts have arisen and a number of scholars have argued that the apparently factual data about colonization, such as the numbers of colonists who are reported to have participated in the colonial adventure, are possibly corrupt.[80] With regard to the size of colonial populations, this is most clearly demonstrated by the existence of different historiograpical traditions, which suggest very different colonial population figures. The first part of this chapter discusses these 'competing' traditions. The aim is not so much to prove Livy right or wrong, but to examine what these alternative narratives reveal about Roman colonization and if they do indeed undermine the Livian tradition. Section 3 explores what happens if Livy's figures are translated into rural population densities. For this exercise two additional variables are required: the size of colonial territories and the percentage of colonists that could have had an urban base.

Section 4 of this chapter is a discussion of what the archaeological record reveals about the demography of colonial landscapes. Archaeology offers a growing and seemingly independent source of information for studying ancient population history, which might offer an interesting touchstone to test the literary tradition. A first analysis of the archaeological record seems to suggest that early

[78] E.g. Salmon 1969, 17; Oakley 1997, 52-53 (on *triumviri*) and 62 (on colonial foundations); Patterson 2006, 197.
[79] E.g. Cornell 1995; Bernardi 1973; Broadhead 2007. This acceptance contrast with the rare, more interpretative and narrative elements of the colonial accounts which are believed to have been more likely corrupted by fictional elements (See for a detailed discussion Oakley 1997, 21-108). For example, Livy's narrative decisions to found colonies are often preceded by accounts of social unrest amongst the Roman plebs who demanded, often through the mediation of a popular leader (in some instances even called a *popularis*), a bigger share of the revenues of war. Such a theme carries strong overtones of the socio-political situation of the Late Republic and various scholars have argued that Livy (or the source he used) is clearly wrong on this point (Cf. Càssola 1988). For a more nuanced view see Patterson 2006. Other elements debated in the transmitted colonial narratives are the stories about recruitment problems and the inclusion of natives in colonies.
[80] Crawford 1995; Bispham 2006, esp. 126. Such a position ties in nicely with more general scepticism voiced in a number of studies on Roman historiography which deny the existence of, or at least the reliability, of the annalistic tradition (e.g. Rüpke 1993). In response, others, most notably Cornell, defend the literary tradition, arguing that there were limits to the creative freedom of Roman historians and annalists and that rhetorical elaborations were only accepted if they did not do violence to traditional facts (Cornell 2005).

colonial landscapes were very thinly populated and that only a fraction of the people suggested by the literary tradition dwelt in these places. The final part of this chapter is composed of a detailed exploration of what reasons might explain this mismatch. Establishing these reasons is not only relevant to our understanding of the demographic landscape, but also, more generally, provides insight into the quality of both data-sets, and, more importantly, the interpretations which can be based on them.

2. Text-based demographic estimates

2.1. Livy's figures

By far the most informative source on the demographical aspects of the Roman colonization programme is Livy (see Table 2). In fact, he is the only source which provides information of this kind in a more or less systematic manner. The transmitted numbers are rather standardized and seem to be closely connected to the juridical status of the colonial settlements. The early citizen colonies (the maritime colonies) appear to have received a fixed number of 300 settlers (recorded for Tarracina and the four colonies founded in 197), while 2,000 seems to have been the standard number of colonists sent to the later, so-called agrarian, citizen colonies (recorded for Mutina, Parma and Luna). The quotas for Latin colonies show more variation, but at least for the period between the Latin War and the Second Punic War three figures are recurrent: 2,500, 4,000 or 6,000; after the Second Punic War 3,000 seems to have been the norm.

495	Velitrae	-	coloni ab urbe
442	Ardea	-	cives Romani (and Rutuli)
418	Labici	1,500	coloni ab urbe
393	Volscian frontier	3,000	cives Romani
385	Satricum	2,000	cives Romani
334	Cales	2,500	homines
329	Anxur	300	coloni
314	Luceria	2,500	coloni
312	Interamna	4,000	coloni
303	Sora	4,000	homines
303	Alba Fucens	6,000	coloni
299	Carseoli	4,000	homines
197	Volturnum, Liternum, Puteoli, Castrum Salerni Buxentum	300	familiae (each)
196	Cosa (suppl)	1,000	adscripti
193	Castrum Frentinum	3,000	pedites and 300 equites
192	Vibo	3,700	pedites and 300 equites
190	Cremona & Placentia	6,000	familiae divided amongst them
189	Bononia	3,000	pedites and equites
183	Mutina, Parma & Saturnia	2,000	homines (each)
181	Aquileia	3,000	pedites plus centurions and equites
177	Luna	2,000	cives Romani
169	Aquileia (suppl)	1,500	familiae

Table 2: Livy's list of colonial populations in Italy.

The apparent standardization of colonial population figures makes it possible to make educated guesses about the number of settlers who enrolled in those colonies for which Livy does not provide demographic information. One of the more recent examples of such an attempt is Cornell's study, in which he gives the probable population numbers for Latin colonies founded between the Latin War and the beginning of the First Punic War (see Table 3). [81]

Date BC	Colony	Region	Adult male settlers	Cum. total	Area (km²)	Cum. total
334	Cales	Campania	2,500*	2,500	100	100
328	Fregellae	Latium	4,000	6,500	305	405
314	Luceria	Apulia	2,500*	9,000	790	1,195
313	Saticula	Samnium	2,500	11,500	195	1,390
313	Suessa Aurunca	Latium	2,500	14,000	180	1,570
313	Pontiae Islands	(Latium)	300	14,300	10	1,580
312	Interamna Lirenas	Latium	4,000*	18,300	265	1,845
303	Sora	Latium	4,000*	22,300	230	2,075
303	Alba Fucens	Central Apennines	6,000*	28,300	420	2,495
299	Narnia	Umbria	2,500	30,800	185	2,680
298	Carseoli	Central Apennines	4,000*	34,800	285	2,965
291	Venusia	Apulia	6,000	40,800	800	3,765
289	Hadria	Central Apennines	4,000	44,800	380	4,145
273	Paestum	Lucania	4,000	48,800	540	4,685
273	Cosa	Etruria	2,500	51,300	340	5,025
268	Ariminum	Umbria	6,000	57,300	650	5,675
268	Beneventum	Samnium	6,000	63,300	575	6,250
264	Firmum	Picenum	4,000	67,300	400	6,650
263	Aesernia	Samnium	4,000	71,300	385	7,035

Table 3: Colonial population estimates of Cornell 1995, 381 (based on Livy).

The general confidence in the reliability of Livy's figures has recently been questioned by a number of scholars who have argued that the seemingly factual data about colonization - the number of colonial foundations, their size and constitutional character - are just as likely to have been invented by Roman annalists and antiquarians as the more narrative elements.[82] An apt illustration of this problem is the confusion which exists in different sources about the number of colonial foundations and about the identity of the colonial triumvirs.[83] These mix-ups are considered to undermine the view that the narratives of the annalists were based on solid contemporary sources, and demonstrate that the deceptively detailed factual data were not copied from an official record, but had to be pieced together. Commenting on to the demographic information provided by Livy, these studies draw attention to the existence of different historiographical traditions which suggest very different sizes for and social composition of colonial foundations.

Intriguingly, the few colonial population figures recorded by the other sources always refer to colonies about which Livy does not offer any information. In that sense the historiographical traditions are complementary (see Table 4). Nevertheless, the scale of the colonization enterprise suggested by

[81] Cornell 1995, 381. His estimates are based on Afzelius 1942.
[82] Crawford 1995; Bispham 2006, esp. 126. Also Sherwin-White 1973², 76 n. 2 for the view that the reported numbers for maritime colonies may be corrupt.
[83] See Chapter 1 for a detailed discussion.

some of these sources diverges significantly from what Livy records. Some revisionist scholars argue that this alternative evidence illustrates that colonial population quotas were not as regular as Livy's list would make them seem and, more fundamentally, that Livy's numbers may be fictional elements intended to emphasize the conjectured state-organized and grand-scale character of the colonial enterprise.[84] The suggestion implicit in these studies is that in reality these foundations were organized much more haphazardly, without the intervention of firm state control, and that they were possibly also more modest in size.

Romulus	Caenina & Antemnae	300	(Dion. Hal, *Ant. Rom*. 2.35)
Romulus	Fidenae	300	(Dion. Hal, *Ant. Rom*. 2.53)
Romulus	Fidenae	2,500	(Plut. *Rom*. 25. 1-3)
378	Sardinia	500	(Diod. Sic. 15.27)
4th century	Corsica	25 ships	(Theophr. *Hist. pl.* 5.8.1)
291	Venusia	20,000	(Dion. Hal. *Ant. Rom.*16/17.5)
218	Placentia	6,000	*homines* of which 200 *equites* (Asc. *Pis.* 3C)
218	Placentia and Cremona	6,000	colonist each (Pol. 3. 40.3-4)
123	Balearic islands	3,000	Veterans who had fought in Iberia (Strabo 3.5.1.)
123	Junonia (Carthage)	6,000	(App. *B Civ.* 1. 24)
122	12 colonies of Drusus	3,000	(Plut. *C. Gracch*. 9)

Table 4: Colonial populations in other sources.

2.2. Competing traditions?

In the surviving literary record only two figures are noted which suggest very different colonial population numbers to those noted by Livy. The first is Diodorus who, under the year 378, records in a chronographic style that the Romans sent 500 colonists to Sardinia with a tax exemption.[85] This is substantially lower than the figures Livy records for contemporary colonies (2,000 and 3,000).[86] The credibility of the colonial adventure described is supported by two sources: an obscure passage in Theophrastos, probably also discussing the fourth century, which claims that the Romans sailed to Corsica with twenty-five ships, possibly to found a settlement there, and by the terms of the Second Romano- Carthaginian treaty,[87] one of whose clauses specifically forbids Romans to found *poleis*

[84] Esp. Bispham 2006, 126. See general introduction for a detailed discussion of the recent critique on the State-organized view on Roman colonization.
[85] Diod. Sic. 15.27. The commentary of the Loeb edition (Oldfather 1954) suggests that Diodorus possibly confused Satricum (colony founded 385) with Sardinia (after Wesseling). On this see also Stylianou 1998, 243-244. The emendation seems a rather forced attempt to reconcile Livy´s account with that of Diodorus. The statement that colonists were exempt from taxes might suggest that Diodorus believed the colony to have been founded outside Italy. In his time, Sardinia was a province which did not enjoy tax exemption as was the case in the Italian peninsula (see also Salmon 1969, 119 who discusses the tax problems concerning the foundation of the colony of Junonia on the site of Carthage in Africa).
[86] For reasons which remain obscure, Bispham argues that the number of Diodorus illustrates that 300 was not a fixed number of settlers sent to maritime colonies. The maritime colony usually is believed to have been devised after the Latin War, except perhaps Ostia for which Livy does not provide a foundation date. Only Dionysius of Halicarnassus records colonies of that size in the early Roman period but these are not located on the coast.
[87] Polyb. 3.24.11- dated usually in 348.

outside Italy.[88] The fact that Livy does not mention this episode suggests that his description of colonial history for this period is incomplete. However, this need not necessarily falsify the information he gives about other colonial foundations of the period.

Diodorus is discussing a type of colonial enterprise about which Livy remains silent for some reason.[89] Therefore, the different sizes could be explained as the result of the specific nature of these overseas colonies; possibly too distant a location was less attractive to Roman settlers. More importantly, Livy's figures for this period do not really suggest that the numbers of colonial settlers were standardized. All transmitted numbers diverge from each other, even from those of the colonial settlements founded immediately after the Latin War. The number of 1,500 recorded for Labici is unique; quotas of 2,000 and 3,000 appear only after the Second Punic War. Of course, this does not prove Livy's information correct; the point being made here is merely that there are no explicit competing traditions or obvious late Republican inventions which undermine it.

The second anomalous figure comes from Dionysius who records that 20,000 colonists were sent to the colony of Venusia in 291.[90] This number is clearly at odds with Livy's tradition as he mentions 2,500, 4,000 and 6,000 as quotas for this period. Militating against the figure given by Dionysius is that it is excessively high. Therefore there is a general consensus that the number is corrupt, or perhaps describes a different reality.[91] Torelli, for example, has argued that the high number is the result of the inclusion of the indigenous population in the census of the colony.[92] Another possibility is that the high number refers to the entire colonial population, including women and children; the actual number of adult males in this reading would be approximately 6,000 (roughly 1/3 of the total population), a figure which tallies with Livy's figures.[93]

Even if these attempts at reconciliation are repudiated, there is little reason to give more weight to the figure of Dionysius than to Livy's recordings. When dealing with population numbers, Dionysius is clearly much more an inventive antiquarian than Livy. Unlike Livy, he commences reporting quotas from the very beginning of the Roman colonization programme which allegedly began with Romulus. According to Dionysius' narrative, Romulus founded several colonies of 300 settlers in size (recorded for Caenina, Antemnae and Fidenae) in Latium.[94] Obviously, it is very unlikely that information of this kind was recorded in this mythical period, let alone that it survived

[88] Theophr. *Hist. pl* 5.8.1. See Torelli 1981; Torelli 1993, 110f. and recently Bispham 2006, 123 on these passages. See however, Amigues 1990 who argues that the interpretation that Romans founded a colony (πόλιν) on Corsica is based on a mistaken editorial correction. The original manuscript states that the Romans set out to build ships (πλο□ον). She thinks that the settlement mentioned in the text is best interpreted as a 'ville-chantier'. See also Salmon 1969, 14 n. 7 who claims these reports must be errors.

[89] The example is not unique. Diodorus (19.100) also records the settlement of soldiers in the territories of Calatia & Nola in 312 and in that of Frusino in 306 (20.80). Livy does not mention colonial or viritane settlements in these areas.

[90] Dion. Hal. *Ant. Rom.*16/ 17.5.

[91] Brunt 1971, 56. Attempts have been made to correct the figure to 2,000. For good discussions of this topic see Marchi and Sabbatini 1996, 19 and Marchi and Salvatore 1997, 9.

[92] Torelli 1999, 94. See also Galsterer 1976, 55 for the view that Dionysius used the late Republican/ early Imperial population figure for Venusia and retrojected it to the early colonial period.

[93] For a discussion of the multiplier needed to arrive from colonist to total populations see below.

[94] Dion. Hal. *Ant. Rom.* 2.35; 2.53.

long enough to could have been consulted by later historians. This is nicely illustrated by a passage in Plutarch[95] which gives a very different number for the size of the colony of Fidenae (2500).[96] Both scholars most likely retrojected information from later periods (both numbers are recurrent in Livy's list) into this legendary past.[97] These examples worryingly illustrate the resourcefulness of some early imperial authors and the real danger of invented elements infiltrating the literary record.

2.3. Compatible traditions

Apart from these two 'competing' population numbers, most sources tie in very well with the Livian tradition. This is especially the case for the late third and second centuries for which several sources give settlers' quotas of the same order of size as Livy suggests (see Table 4). Information for the pre-Punic Wars period is much sparser. However, there is some indirect information provided by Polybius which supports Livy's tradition.

In his enumeration of the military strength of Rome and its allies at the time it was under threat from the Gauls of northern Italy in 225, Polybius states that the Latins had 80,000 foot and 5,000 cavalry available for service; this total figure is compatible with the number of male colonial settlers suggested by Livy's recordings. In total, Livy describes the foundation of twenty-one Latin colonies in the period between the Latin War and 225. The number of settlers is not always recorded, but since their number appears to have been standardized, it is possible to make a reasonable estimate of the total number of Latin colonists. Two slightly different approaches can be used for this purpose: either the number of colonists is extrapolated from the size of the territories, whereby the larger colonies are assigned 6,000 and the smaller 2,500 colonists,[98] or an average of 3,800 colonists is used.[99] Both methods result in a total of roughly 80,000 colonists. However, since it is likely that Polybius' number also included the population of the seven old Latin colonies which retained their independent status after the Latin War and as possibly the two old Latin cities of Praeneste and Tibur also did, the match is less strong than appears at first sight.[100] If only the seven old Latin colonies are added to Livy's list and the same mean of 3,800 colonists per colony is used, Livy's figures suggest a higher Latin population (circa 25 % higher).[101]

[95] Plut. *Rom.* 25. 1-3.
[96] On this see also Bradley 2006, 163 and Bayet 1938, 113. n 6. It is possible to combine the apparently contradictory figures of Dionysius and Plutarch by arguing that the first number refers to the settlement of a garrison in the towns, and the second to the actual number of settlers who received land in the confiscated territory. However, in the case of Caenina and Antemnae Dionysius clearly states that the land was allotted to the colonists who garrisoned the town (2.35). Also in 498, when half of the territory of Fidenae is recorded to have been divided again amongst Roman citizens, Dionysius (5.60) suggests that the land was allotted to those sent to the town as a garrison.
[97] The number of 300 settlers could have been conjectured based on the tradition that the organization of Romulean Rome was based on three tribes. Hence, each tribe would have sent out one *centuria* of *coloni*.
[98] Cornell 1995, 381.
[99] Brunt 1971, 56.
[100] Brunt even suggests that some Hernician and Volscian cities were included amongst the Latins by Polybius (Brunt 1971, 56).
[101] The colonies are: Nepet, Sutrium, Ardea, Signia, Norba, Setia, Circeii.

This discrepancy can be explained in several ways. Brunt, for example, has proposed that the numbers mentioned by Polybius refer only to the *iuniores* (males between 17 and 45 years of age). To arrive at the total male population, the number has to be raised by 30 per cent. Brunt adds another 20 per cent to compensate for the probable under-registration of the allies and Latins 'who were less zealous to provide accurate lists of their manpower, as they had to fight in wars not of their own choice'.[102] In this fashion, a total male population of 134,000 Latins is reconstructed. This number agrees roughly with Livy's figures if it is assumed that the old Latin, Hernician and Volscian cities were indeed included in Polybius' list.[103] A somewhat different interpretation has been proposed by Bernardi.[104] He supposes that the numbers of colonial settlers reported by Livy also refer to *iuniores*. He goes on to argue that, at the time that the list of available manpower was compiled, the Latins already had 12,000 active troops (6,000 in the field and 6,000 in Rome). These must be added to the 85,000 Latin men still available for service at the time the inventory of 225 was drawn up. Bernardi thinks it is unlikely that Praeneste and Tibur or any of the Hernician and Volscian cities were included in the list; it recorded only the old Latin colonies. Since he believes that these had modest populations (an estimated 1,500 *iuniores*), the total which can be calculated on the basis of Livy's figures (estimated at 90,000) tallies neatly with Polybius' list (97,000) and even allows for modest population growth.

Not everyone agrees with these elegant attempts at reconciliation. De Ligt, for example, questions the hypothesis that Polybius' figures refer to *iuniores*. He points out Brunt's unequal treatment in his attempt to interpret the number presented for the Roman army strength and those for the Latins and allies.[105] In the first case, Brunt assumes that the number represents the total male population, while for the latter he believes the figure to represent *iuniores* only. De Ligt rightly questions whether such a distinction is valid and argues in favour of the interpretation that Polybius' list contains all adult males available for service.[106] In the scenario he sketches, the difference between the number of Polybius and that of Livy is explained principally as the result of under-registration (estimated at 20 %).[107]

Finally, Livy's numbers can be lowered in an attempt to reconcile both data-sets. It is not clear if the numbers of colonists he mentions reflect the actual number of colonists who migrated to the newly conquered lands or whether they are best understood as the number of vacancies set by the

[102] Brunt 1971, 57. See also Lo Cascio 1999, 168 on under registration among Latins.
[103] *Prisci Latini*: Tibur, Praeneste, Cora. Hernician cities: Aletrium, Verulae, Ferentinum. Volscian cities: Fabrateria Vetus and Aquinum. See, however, Bernardi 1973, 94 n. 164 who argues that Tibur and Praeneste were *socii* (based on Polybius 6.14, 8) while the Volscian and Hernician cities were *cives sine suffragio*. Sherwin-White 1976, 227-228, rejects this last view.
[104] Bernardi 1973, 93-95.
[105] De Ligt 2003, 7-8.
[106] For a recent crtique of this position see Hin 2008.
[107] De Ligt 2003 see esp. n. 22. For the opposite position see Lo Cascio 1999, 168-169 who argues that all figures given by Polybius represent *iuniores* only. He goes on to claim that the number of Latins mentioned by Polybius reflects the *iuniores* of Latium Vetus and Latium Adiectum only, hence excluding many of the Latin colonies outside this territory. This last theory is very implausible (see De Ligt forthcoming).

Roman State. On several occasions, Livy describes how the Roman State had difficulties in finding enough volunteers to allow it to carry out its colonization programme, which could mean that fewer people migrated to these territories than had been originally planned. In other cases, some of the original colonists, perhaps even all of them, seem to have abandoned their colonies and returned to their original homes or to have moved on to other, more promising places. This option seems to have been taken by the colonists in the Roman colonies of Buxentum and Sipontum.[108] It is also possible that these colonies suffered from natural attrition which, especially in closed militaristic societies which the Latin colonies were, was usually high. Rathbone, for example, argued that in the case of Cosa continuous warfare throughout the third century caused a population decline of 30 per cent in the seventy-five years between the foundation of the colony and the end of the Second Punic War.[109]

Although there is disagreement about the exact details of the different sets of population figures offered by Livy and Polybius, it is hard to escape the conclusion that they are roughly compatible and attribute a similar size to the Latin population. This in itself does not prove that their figures are correct; both could have been based on the same wrong presumptions or on different assumptions which led to similar conclusions.[110] The main aspect of the apparent match is that it brings the information chronologically closer to the actual time of the events (Polybius was writing in the second century and possibly Fabius Pictor was his source).

For neither Latin colonies founded after 218 nor citizen colonies are there any alternative literary sources giving numbers of settlers which could either confirm or question Livy´s tradition. Epigraphical evidence from Aquileia,[111] Cales,[112] and Puteoli[113] supports Livy´s claim that several colonies (or supplements) were founded in the second century; regrettably none records the number of settlers. Interestingly, the epigraphically attested supplement of Cales is not reported by Livy, perhaps

[108] On Buxentum and Sipontum see Livy (39.23). For other literary evidence concerning difficulties finding volunteers for colonies see Càssola 1988, 9-10. However, Càssola regards the references to recruitment difficulties in the earlier colonies unconvincing and possibly anachronistic. For the period after the Second Punic War in his view these accounts become more convincing since it was probably a time of demographic crisis.

[109] Rathbone 1981, 18-19. See also De Ligt 2003, 23-24 n. 22 who emphasizes the impact of the First Punic War on manpower. It is interesting that Rathbone's estimate of a 30% population decline is not derived from a noted discrepancy between the numbers of Livy and Polybius, but from the fact that in 197 a supplement of 1,000 colonists was sent to the area after complains by the Cosan magistrates that they were no longer able to send the required number of troops to war (Livy 33.24). Rathbone suggests the population of Cosa decreased from 3,500 to 2,500 families in the course of the third century; consequently the supplementary 1,000 restored the original number of colonists in the area (=30%). The argument has been criticized in recent studies on demographic behaviour during the Roman Republic. The main bone of contention is that, in the long run, a high mortality rate among men of military age does not necessarily lead to a population decrease, since militaristic societies often develop specific (marriage) strategies to increase fertility (see Rosenstein 2004, esp. 252 n. 3 and De Ligt 2007).

[110] Several scholars have questioned the validity of Polybius' list of available manpower. For example, Scheidel 2004, 4 argues that the 'extraordinarily smooth ratios that are built into his {Polybius'} account {…} casts serious doubt on the validity of *any* of the allied figures proffered by this text, and raises the possibility that this breakdown was constructed from the top down.' Scheidel does not discuss the possible congruency between Polybius figures and the estimates of the Latin population based on Livy's information. See Yntema 2008 for archaeological evidence which supports the figures of Polybius concerning the population of Salento. Further discussions on the reliability of Polybius' list see Hin 2009, 163-167 and De Ligt forthcoming.

[111] CIL I², 621.

[112] ILS, 45.

[113] CIL X¹, 1781.

an indicator that the scale of the whole reinforcement programme was larger than Livy's narrative suggests.

2.4. Who are the adscripti*?*

We have seen that according to Livy a substantial number of people could sign up for colonization, varying in the case of Latin colonies between 2,500 and 6,000 souls. But who are these people? Livy offers only a few and often controversial clues about their sex and socio-economic backgrounds.[114] Perhaps the most informative are the numbers he gives for the Latin colonies founded after the Second Punic War. For these colonies Livy makes a distinction between the number of *pedites* and *equites* who enrolled.[115] The fact that he uses military categories to describe the colonists seems to suggests that they were adult males who had served in the Roman army.[116] This understanding of Livy's figures is supported by the fact that this division in ranks mirrors exactly the terminology used for distributions of money to veterans in this period.[117] Moreover, the practice of rewarding veterans with land is clearly attested to for the years 201-199, when the veterans of Scipio received 2 *iugera* of land in Samnium and Apulia per year of service.[118]

In contrast, the beneficiaries of citizen colonies and supplements to Latin colonies in this period are described in more neutral terms, namely as *homines, adscripti, cives Romani* or as *familiae.* On the basis of this consistent difference, Erdkamp argues that the different terminology was used to describe distinct social realities. While veterans might have been the prime beneficiaries of Latin land distribution programs, the *proletarii* were the most likely candidates for land in citizen colonies and supplements.[119] Given the fact that Livy on several occasions clarifies that his figures refer to complete families,[120] it seems safe to assume that as a general rule the colonial allotments were distributed per family and that only heads of (potential) families were counted as *adscripti*.

This terminological argument, however, does not apply to the colonial situation before the Second Punic War and we cannot simply assume that the situation in the 2nd century aptly describes the procedures of earlier periods in Roman colonial history.[121] As I shall argue later in this book, there is evidence to suggest that the nature of the Roman colonization program changed in the course of the

[114] The ethnic background of colonists and the question whether indigenous people could join the colony is discussed in Chapter 5.
[115] In the case of Aquileia also centurions are mentioned (cf. Table 2).
[116] Erdkamp forthcoming. See, however, Galsterer 1976 who explains these classes as reflecting the need to create property classes in the new community.
[117] Erdkamp forthcoming; for the list see Brunt 1971, 394.
[118] See Table 6 for references.
[119] This view is supported by the different sizes of allotments distributed in Latin and citizen colonies; the former are up to 10 times larger than the latter (cf. Table 13). Although the thesis of Erdkamp is convincing, there are exceptions to his proposed scenario. For example, in the case of the Latin colony of Carteia founded in the second century it is clear that the beneficiaries were not veterans, but bastard sons of Roman soldiers who had stayed behind (Livy 43.3). Also, Erdkamp uses the example of Cosa to demonstrate the military character of Latin colonies (i.e. that the colonial town was organised as a military camp). However, based on the chronology of the excavated city plan Fentress (2000) connects this settlement with the supplement which was sent to Cosa in 197 and not with the first generation of colonists (sent there in 273). According to Erdkamps model the supplement should have consisted mainly of proletarians.
[120] See Table 2.
[121] The earliest reference to *pedites* as beneficiaries of colonial allotments dates to 218 (see Table 4).

third and second centuries. Therefore, we need to investigate the evidence diachronically. Regrettably, Livy is very vague about who qualified for colonization in the period before the Punic Wars. When Livy describes the foundation of colonies of this period (Latin and citizen colonies alike), he consistently refers to the people sent there as *homines*, or earlier as *cives Romani,* or *coloni ab Urbe*. The consistent absence of military terminology in this period may not have been coincidental and there is good reason to believe that Livy assumed that the recipients of land in these early colonizations programs were predominately impoverished plebeians. Livy on several occasions mentions explicitly that the founding of colonies was closely connected with social tensions in Rome and that, besides having a military function, the purpose of colonization was also to improve the living conditions of the restless and potentially dangerous plebs.[122]

This plebeian motive, however, is rejected by various scholars as it recalls the socio-economic situation of the Gracchan and late Republican periods.[123] More importantly, it seems to conflict with the strategic function colonies had in this period which was to defend Rome's expanding borders. This strategic objective was surely best served by restricting enlistment in a colony to adult males with some military experience.[124] Support for this position can be found in other sources like Diodorus and Dionysius who on occasion explicitly mention that veterans were the beneficiaries of colonial land division programs also in the pre-Punic War period (although none of these references refer to Latin colonies founded after the Latin War).[125] The issue about whether colonists were veterans or proletarians is difficult to resolve on the basis of the available and seemingly contradictory literary evidence, but perhaps a sensible standpoint is that of Gabba who maintains that the sources are not necessarily incompatible and that we may assume that colonists were recruited from both the lower social strata and from the propertied classes, predominately the younger sons of *assidui* who had few prospects at home.[126]

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[122] Patterson 2006, with further references for a good discussion of the evidence. In support of the Livian traditions, Oakley and Cornell have pointed out the rise in social tension in the early and mid-Republic in periods during which no colonies were founded (Oakley 1993, 18-22; Cornell 1989b, 323-4; Cornell 1995, 330-333 and 393-394). Also compatible with this tradition is the Letter of Philip V of Macedonia to the Larisseans in which he wrote that 'the Romans, who, when they free slaves, admit them to citizenship and grant them a share in their magistracies, and in this manner, they have not only increased the size of their own country, but have also been able to send colonies to nearly 70 places' (SIG 543, translation Lomas 1996, 47). Although it is not stated explicitly, this controversial text (on this see Section 1.3) seems to suggest that freedmen signed up for colonization. Also some fragile archaeological evidence mainly from colonial cultic contexts may suggest a Plebeian ideology (Torelli 1999, 78; see also Bispham 2006, 104 for a similar plebeian outlook attested in temple B in the forum of Cosa).

[123] Càssola 1988; Erdkamp forthcoming.

[124] Although it seems reasonable to assume that the military function of colonies were best served by sending military experienced persons to these remote places, I am less convinced that this necessarily contradicts with the plebeian motive. There is reason to believe that at some point during the fifth or early fourth century Plebeians also served in the army (for a good discussion see Momigliano 2005, who, however, argues that the plebeians before that time were excluded from service).

[125] Diodorus (19.101) and Dion. Hal. *Ant. Rom.* (4.63,1). See also Frontin (4.3.12) for an early reference to soldiers as the beneficiaries of land in the land division of Dentatus (contradicted by Plin. *NH* 18.18 and Val. Max. 4.3.5). According to Càssola early colonization was often connected with a form of private warfare organized by influential individuals and fought on a voluntary base. In such a situation land was considered a form of booty which was distributed amongst the men who conquered the land by the generals (see Càssola 1988, 17. See also Galsterer 1976, 49-51 and Bradley 2006, 168-169 for more evidence in favour of this argument; in general on the influence of clans during the Roman Republican, Terrenato 2007).

[126] Gabba 1988, 20.

Despite the disagreement about the socio-economic background of colonial settlers, all scholars so far seem to agree that the *adscripti* were exclusively adult males.[127] But, usually few arguments are provided to back up this view. Probably this is the result of the fact that it seems evident that only males would have been allowed to register for dangerous colonial adventures, considering also the socio-political organisation of Roman militaristic society in which as a general rule only adult males counted in legal or political issues.[128] Although I subscribe to this reading, it seems justified to provide some additional arguments for this position, since it implies rather high migration rates and colonial population densities (cf. Section 2.3).

Probably the strongest evidence for the view that the *adscripti* before the Punic Wars were adult males comes from the earlier discussed list of Italian manpower resources in 225 provided by Polybius.[129] The fact that his figures for Latins able to wear arms is roughly compatible with the total number of colonists that can be deduced from Livy's numbers suggests that the *adscripti* were predominately adult males. Some fragile conformation of this reading can be found in Appian, who recalls that 2,000 men from Alba Fucens came to help Rome in defending her gates against the Carthaginian army.[130] According to Livy Alba Fucens counted 6,000 colonists; if these were predominately adult males this implies that a sensible 30% of the male population left their homes to help Rome. On the other hand, if we would assume that the 6,000 *adscripti* recorded by Livy also included females and children, this would imply that all adult men from Alba went to Rome. Such a scenario is unreasonable. With the enemy so close by, surely a substantial number of soldiers needed to stay behind to defend the hometown.[131] Considering this evidence, it is difficult not to conclude that according to the literary tradition the people enlisting for colonization were adult males.

Whether the *adscripti* were veterans or urban plebs, and at what age they embarked on the colonial adventure and if they brought a family with them cannot be established convincingly on the basis of the available evidence. Hence, it is difficult to estimate what the total size of the colonial populations was. Usually a multiplier of 3.17 is used to calculate whole populations from adult males in the Roman world.[132] However, especially during the first pioneering years of their existence,

[127] The list is endless. To name just a few: Brunt 1971, Bernardi 1973, Cornell 1995.
[128] For a recent nuancing view see Hin 2008 who draws attention to the fact that women *sui iuiris* did exist during the Roman Republic.
[129] Section 2.2.3.
[130] App. *Ha*. 39.
[131] It seems that Livy 29.15 also points in this direction. In this passage Livy recalls the punishment of the 12 colonies which had stopped to provide troops during the 2nd Punic War. As a retribution for this indulgence, each of those colonies had to supply a contingent of infantry twice as numerous as the largest they had raised since the Carthaginians appeared in Italy, and 120 cavalry in addition. Regrettably Livy does not inform us about the number of infantry they usually had to supply, but a very fragile indication is given by the mentioning of 120 cavalry. The ratio between *pedites* and *equites* in colonies is usually between 1:10 and 1:16. This means that if the colonies had to raise a similar percentage of their infantry as they were required for their cavalry, that would suggests around 1200 and 1920 *pedites*. Also Livy 5.30 could be used to support the reading of Livy's *coloni* as adult males. Livy recalls in this passage the exceptional decree that in the case of land distribution in the territory of Veii also children were allowed a piece of land. Livy explicitly states that this was an abnormal situation. However, the passage is generally considered corrupt as it recalls Gracchan rhetoric's (compare for example with App. *BCiv* 7-11).
[132] On this see Scheidel 2000, 21-24 with references. The multiplier is based on the level 3 of the Coale and Demeny standard population model (with a life expectancy of 25 years and 0% population growth).

colonial populations are unlikely to have had a demographic structure that followed that of a general standard population. For example, one might expect that especially young men had the courage to sign up for joining a dangerous colonial adventure. Men aged in-between 17 and 45 usually comprise 43.5 % of all males.[133] To account also for men below age 17 and above age 45, and for women, we need to use a multiplier of 4.6 to approach the hypothetical total population of a colony. The abnormal starting age structure of the colonial society should in theory, result in higher total populations than if we would assume that also older men were included amongst the *adscripti*.

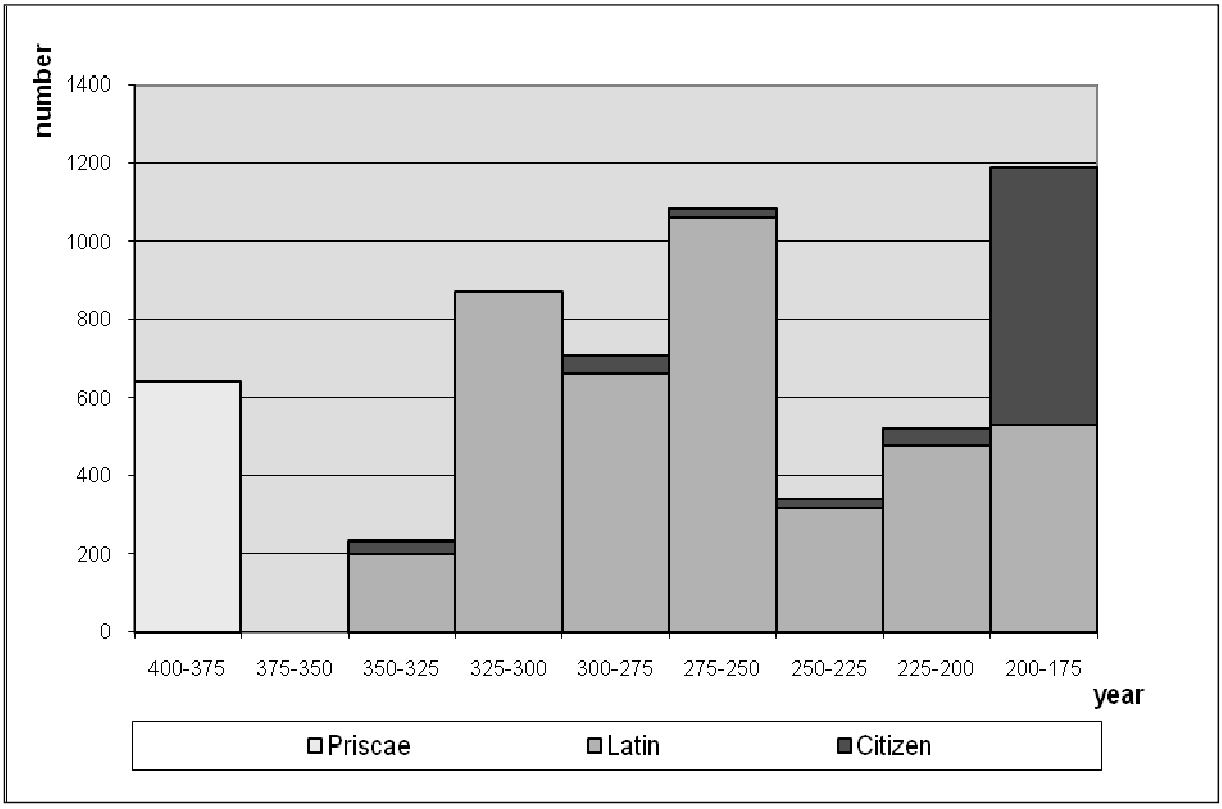
On the other hand, there are a number of factors which seriously counterbalance this positive age effect, and it seems unrealistic to assume that all the enlisted colonists were actually successful in raising a reproducing family of two surviving children. For example, one could easily imagine that mortality rates were higher than usual under those unstable pioneering circumstances, and also that it was more difficult to find suitable brides in these remote areas, or that one married later than usual (thus restraining fertility). The most important factor which probably impeded 'normal' demographic development, however, is emigration. The sources make it perfectly clear that colonies suffered strongly from emigration.[134] Besides first generation colonists who abandoned their colonial farms, it is likely that younger sons of colonists especially, often left the colony and looked for new and more promising opportunities in the city of Rome or in other, newly founded colonies.[135]

The impact of all these different factors seems to me impossible to quantify on the basis of the available information. But considering the good deal of literary evidence reporting that colonies had difficulties in maintaining population levels and that as a consequence they were unable to contribute the expected number of troops to Rome, I expect that, at least for the middle and long term a multiplier of 4.6 is far too high. Therefore, also considering that we have no concrete evidence suggesting that the *coloni* were indeed all *iuniores*, I shall apply in the rest of this book a multiplier of 3.5 for calculating whole populations, which implies that either a substantial number of older men were included amongst the *adscripti*, or, in the case we assume they were *iuniores* only, that they were not all able to raise reproducing families of two surviving children. The last scenario finds some fragile support in the already discussed difference between the Latin colonial population size which result from Livy's list and the manpower resources recorded by Polybius, which, depending of once reading of these numbers, are about 20-25% lower.[136]

[133] Cf. Hin 2008, 199.
[134] On this see Broadhead 2007 and 2008; Erdkamp 2008 and forthcoming. Although Broadhead argues that there were juridical restrictions on emigration from colonies (in order to guarantee stable manpower resources), his studies demonstrate clearly that these laws often were not respected and that colonies suffered from depopulation.
[135] Erdkamp forthcoming.
[136] Cf. Section 2.2.3. Using a very different strategy Rathbone 1981, also concludes that Latin colonies had lost c. 30% of their original population.

2.5. Livy's numbers and Roman manpower

If Livy's numbers are indeed interpreted as adult males this implies that by 225 a total of between 80,000 and 100,000 adult male colonists had migrated to Latin colonies; that is roughly an average of 800 adult males every year (see Graph 1). Cornell protests that such a drain on the Roman population is highly unlikely to have occurred as it could not be compensated by natural growth and hence would imply a heavy loss of Roman military power.[137] He thinks that this does not imply that Livy's figures are corrupt, but instead that a substantial percentage of the settlers came from the allied communities. The inclusion of allies in colonial enterprises is indeed recorded in the sources, foremost however, those relating to colonial enterprises of the second century. In the case of the earlier colonies, on various occasions Livy explicitly states that the colonists were Roman citizens (see Table 2). If this assertion is indeed true, does this necessarily lead to the conclusion that Livy's numbers are incredibly high? The whole issue, of course, depends on the size of the total Roman population; another hotly debated subject.



Graph 1: Migration per annum as implied by the literary sources (total per 25 year/ period).

[137] Cornell 1995, 367. Latin migrants forfeited their Roman citizenship and therefore could no longer serve in the Roman legions. They were required to send troops, but these fought with the other allies.

Literary information about the size of the Roman population comes from the census figures reported by Livy; figures whose value is heavily disputed. For the late Republican period, the debate tends to revolve around what precisely these numbers stand for;[138] whereas the discussion for the pre- Punic Wars period concentrates more heavily on the question of whether the transmitted figures are genuine. Most scholars agree that the early census figures are probably annalistic inventions.[139] Their most important objection is that the size of the Roman territory probably could not have sustained the size of population suggested by the literary sources. The first to point this problem out was Beloch.[140] He thought that the size and productivity of the Roman territory in the early Republican period could have sustained a population no larger than 20,000 to 25,000 persons. Others have raised this number slightly (ranging between 35,000 and 50,000), but all estimates are considerably lower than that suggested by the census figures.[141]

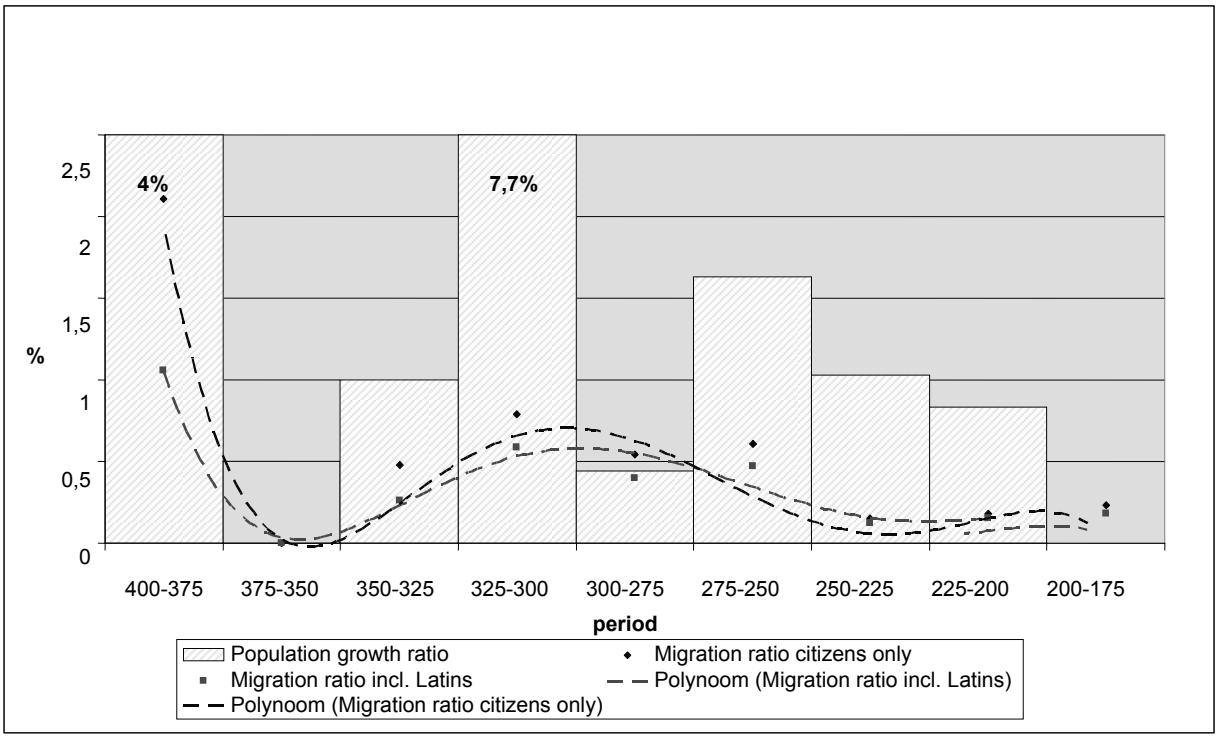
For the mid-Republican period the most influential estimates of the Roman population are without doubt those made by Afzelius.[142] In principle, his calculations are based on an estimated population density per sq. km of Roman territory, which he deduces mainly from Polybius' list for 225. Since the list gives the manpower per region of Italy, it is possible to work out regional population densities. Afzelius goes a step farther and breaks these larger regional estimates down into units of the size of city-states or tribes, principally by using comparative evidence from the early twentieth century on infra-regional differences in population densities. This strategy produces the following population estimates:

[138] E.g. Hin 2009; De Ligt forthcoming.
[139] Esp. Brunt 1971, 27; Beloch 1926, 216-224. A small minority maintains that they are perfectly plausible. This position has been fervently advocated by Ward see (Ward 1990 with further references) He argues that early Republican census figures (those recorded before the Veian War) make perfect sense since they are consistent with other data from the early Roman period such as the size of the Roman ruling class, the size of the city of Rome and Roman territorial expansion. Fundamental to his argument is the view that the early Republican census figures, in contrast to later periods, did not count only males, but the whole population. Ward's thesis has found little support among Roman demographers and has been dismissed as the unsuccessful attempt of a philologist to rescue the classical tradition (Scheidel 2001,7 n. 30 and 52 n. 207).
[140] Beloch 1886; Beloch 1926, 209; See Scheidel 2001 for a good recent discussion of Beloch's method and its responses.
[141] According to Cornell 1995, 205-206, other evidence such as the probable size of the centuriate army and comparative evidence from neighbouring Etruscan cities tallies best with an estimated population of 35,000.
[142] Afzelius 1942; accepted by most scholars (e.g. Cornell 1995; Scheidel 2006; De Ligt forthcoming; all with minor modifications).

Table 5: Population estimates up to 290 by Afzelius 1942

346 (p. 140-141)	**338 (p. 153)**
Population size: *Romans* Ager Romanus: 2005 kmq= 126400 persons *Latins* Latin League: 2005 kmq= 96600 persons Sutium and Nepet: 330 kmq= 11880	Population size: *Romans* Ager Romanus: 5525 kmq= 347300 *Latins* Latini and other independent free communities in Latium: 2980 kmq= 137100
304 (p. 169-170)	**290 (p.181)**
Population size: *Romans* Ager Romanus 6285 kmq= 405000 *Latins* Old Latins: 1805 kmq= 82900 New Latin colonies: Cales: 100 kmq= 3600 Fregellae: 305 kmq= 14700 Luceria: 790 kmq= 28400 Saticula: 195 kmq= 7000 Interamna, Suessa, Pontia: 455 kmq= 21900 Sora: 230 kmq= 11100	Population size: *Romans* Ager Romanus: 15295 kmq= 568400 persons *Latins* Latins up to 304: territory 3880 kmq= 169600 persons New Latin colonies: Alba Fucens and Carseoli: 705 kmq= 25400 Narnia: 185 kmq= 6700 Venusia: 800 kmq= 28800 persons Hadria: 380 kmq= 13700

This approach in which the Italian population numbers are reconstructed is far from ideal as it is based on several problematic assumptions.[143] Nevertheless, at the moment it is the best there is and the majority of scholars (including Cornell) agree that it gives a rough idea of the size the Roman population in this period. If these speculative estimates (which are considerably lower than what the literary sources imply) are accepted, the following colonial migration rates can be modelled:



Graph 2: Annual migration ratio (M / P*100. M is Cornell 1995, 381 (based on Livy); P = Scheidel 2005, 6 table 1 (based on Afzelius 1942).

The average annual migration for the pre-Punic Wars period of in-between 0.4 and 0.8 per cent of the total population is rather high compared to evidence for other periods and regions. Indeed it is so high that it is unlikely to have been compensated by *natural* growth (usually set at 0.2 to 0.3%)[144] but this does not necessarily imply a loss of Roman manpower as Cornell has suggested. There are several reasons to back up this assertion. The first is that the graph clearly shows that there is a relationship between Latin colonial migration rates and overall Roman population growth (mainly the effect of the enfranchisement of conquered territories and peoples). Since colonial migration rates are considerably lower than the estimated population growth ratio, this finding suggests that, despite the large-scale colonization programmes, the Roman military potential could have increased significantly after 338.[145] Interestingly, the phases of intensified migration also correspond to periods of relatively low military

[143] Especially the reliability of Polybius 2. 24, fundamental to Afzelius' estimate, has been questioned. See Scheidel 2004, 4, but see De Ligt forthcoming for a defence of the credibility of this source.
[144] Scheidel 2003; also Osborne 2004, 164. The theoretical maximum is usually put at 2.3%, with an average life expectancy of 25 (Hin 2009,157).
[145] Manumission of slaves is also likely to have contributed in restoring the annual growth rate.

mobilization rates.[146] The second finding relates to the issue that possible loss of manpower depends strongly on the question of who were actually sent to these colonies. If, as Cornell argues, settlers were predominantly recruited from the lower social strata who generally did not serve in the army, colonization need not have diminished Roman manpower resources. In such a scenario, the immediate military impact would have been considerably lower and easily compensated by the troops colonies had to deliver to Rome in periods of war.[147]

The migration rates modelled for the pre-Latin War period (2-2.5 % and a little more than 1 % if Latins could join) although constantly below population growth rates, are extremely high. However, it is unclear if all colonial foundations recorded for this period must be considered new, autonomous Latin communities. Especially colonies founded on territory attached to the *ager Romanus*, such as Labici and Satricum which do not appear in Livy's list of old Latin colonies, might be better interpreted as areas of viritane settlement or *coloniae civium Romanorum*.[148] If this postulation holds true, the foundation of these colonies had no direct effect on Roman military manpower. For the other early colonies such as Circeii, Setia, Nepet and Sutrium, for which Latin origin and status is more likely, information about the number of Romans colonists who joined the scheme is absent. Possibly the majority of these colonists was recruited among Latins or from newly enfranchised groups.

2.6. Areas of viritane settlement

The sources record several laws which regulated the viritane distributions of land in the period between 393 and 173 (see Table 6). Unlike the Latin and citizen colonization programmes, no source mentions the number of people who received land under this scheme. Livy often suggests that viritane colonization was open to all plebeians or, in later times, all Roman citizens.[149] The absence of fixed quotas of settlers in the sources might not be a coincidence, but could have been an outcome of the fact that occupation of these lands was indeed open for all who wanted to take up the challenge.

[146] According to Scheidel 2006, 220, fig. 6 in the late fourth and first half of the third century mobilization rates drop from 23 to 10 % of the Roman citizenry aged 17+.
[147] For this discussion see Section 2.2.4.
[148] Cornell 1995, 302; See also Oakley 1997, 343 who notes that the *triumviri* were all Roman (also Bradley 2006, 167).
[149] The clearest case is Veii, about which Livy informs us that all plebeians and not only the heads of families but also all the children received an allotment so 'that men might be willing to bring up children in the hope that they would receive their share' (Livy 5.30). In case of the Ager Gallicus, Livy even states that each Roman citizen received an allotment of 10 *iugera* (Livy 42.4).

393	Ager Veientanus divided amongst the plebeians including children (Livy 5. 30)
390	Land in Ager Veientanus assigned to new citizens (Livy 6.4)
387	Ager Pomptinus divided among the plebeians (Livy 6.21)
338	Ager Latinus, Privernas and Falernus divided amongst the plebeians (Livy 8.11)
312	Q. Fabius allotted land to his soldiers in the confiscated territories of Calatia and Nola (Diod. Sic. 19.100)
306	One-third of the land was confiscated from Frusino which Diod. says was distributed to colonists (Diod. Sic. 20.80)
290	Land conquered by Dentatus was distributed to plebeians according to Pliny (*NH* 18.18). Other traditions describe the recipiants more generically (Vir. Ill. 33; Val. Max. 4.3.5. give *populus*) or veterans (Front. *Str*. 4.3.12). According to Columella (1. *praef.*14) and Frontinus, the land was located in Sabinum.
232	The Ager Gallicus was divided among Roman citizens, some sources also include Picenum in the division programme (e.g. Polyb. 2.21; Cic. *Ad Brut.* 14.57)
201	Ager publicus in Samnite and Apulian territory divided amongst veterans who had fought with Scipio in Spain or Africa (Livy 31.4).
173	Viritane land division in the Ager Ligustinus and Ager Gallicus. Romans received 10 *iugera* of land, Latin allies 3 *iugera* (Livy 42.4).

Table 6: Areas of viritane settlement

Viritane land division programmes are believed to have been large-scale enterprises which involved large numbers of people.[150] This impression is based on the considerable size of the territories put up for distribution and the relatively small allotments individuals received (2-7 *iugera*). More precise estimates cannot be made on the basis of these two criteria alone. Not only are there problems concerning the exact size of the territories (and the percentage under cultivation), but it is generally agreed that only part of the land was actually distributed and therefore considerable tracts remained *ager publicus*.[151] Moreover, the very small allotments (2-7 *iugera*) recorded as having been distributed to colonists cannot be taken as a clue to the population density in the area (which consequently would have been in the order of in between 57 to 200 colonists per sq km.). Such tiny allotments, if authentic, were obviously too small to sustain a family and an unknown amount of additional land must have been available in the neighbourhood which settlers could use to supplement their income.

A possible clue to the more precise number of viritane colonists is provided by the creation of new *tribus*. Taylor has demonstrated convincingly that there is a strong correlation between areas of land distribution schemes and those of new tribes (Table 8). This fact, she proposes, strongly suggests that tribes were created primarily for these viritane settlers.[152] The logical consequence is that the numbers of people who were initially enrolled in a tribe, more or less reflect the number of viritane colonists who migrated to the area. Working on this assumption, Oakley has recently estimated that between 338 and 299 a total of 18,000 adult males were involved in viritane settlement schemes.[153] In his calculation, Oakley assumes that some 3,000 adult male Roman settlers were enrolled in every new tribe, which results on average in a density of more than twenty colonists per sq km (see table below

[150] Cf. Cornell 1989a, 403 estimates that in the late fourth and early third century between 20,000 and 30, 000 Romans were settled in viritane schemes. Estimates of the number of settlers who migrated to the Ager Veientanus vary considerably, but all suggest numbers in the thousands (see Roselaar 2010, 299 n. 3 with references).
[151] E.g. Cornell 1989b, 326.
[152] Taylor 1960, 66-67.
[153] Oakley 2005, 663-665.

for the estimated sizes of these tribes); that is, about 25-50 per cent higher than is estimated for the average Latin colony of the period (see below).

On which data or arguments the estimate of 3,000 settlers per tribe is based is obscure. One may suspect that it is derived by dividing the total Roman population by the number of tribes. A figure in that order of size is indeed the result if the estimated Roman population of the late fourth century made by Afzelius is taken and divided by the number of tribes founded up to that time.[154] However, Afzelius states that about half the people who inhabited the *ager Romanus* in that period were *cives sine suffragio,* who were not enrolled in tribes.[155] When adjusted to accommodate this factor, Afzelius' population estimates produce a result of fewer than 1,800 adult males per tribe.[156] This figure is little more than what is suggested by the only figure transmitted in the literary sources. Several sources report that when the tribus Claudia was founded for newly enfranchised Sabines in 504, 5,000 persons were enrolled, a sum which, if taken to include females and children, corresponds to about 1,500 adult males.[157]

A problem with all calculations based on an average number of adult male citizens per tribe is that they assume that all tribes were of the same size. Any calculation has to reckon with the fact that the different sizes of the territories covered by tribes suggest that this might not have been the case.[158] The territories of the twenty-one old tribes especially are much smaller than those founded after the conquest of Veii. On average, the territories of old rural tribes are thought to have measured approximately 66 sq. km,[159] whereas several of those founded later cover territories larger than 200 sq. km (see Table). The rub is that, even if we accept these territorial reconstructions to be indicative of differences in the number of people enrolled in these tribes, this is still not evidence to support the view that on average 3,000 people enrolled in these new tribes. On average, only a few more than

[154] E.g. the *Ager Romanus* in 338 according to Afzelius 1942, 153 (accepted by Cornell 1995, 35) could sustain a population of 347,300 souls, divided by the 29 tribes founded up to 332 results in 3,629 adult males.

[155] Afzelius 1942, 153. The population estimates of Afzelius' are roughly compatible with census tallies for this period if it is assumed that they represent all citizens with voting rights. For 340: 165,000 and 160,000; for 334-323: 130,000, 150,000 and 250,000 are transmitted. The transmitted 250,000 is clearly at odds with Afzelius' estimates. See for a discussion of the (un)reliability of these early census tallies the discussion above.

[156] The 29 tribus of 332 each had an average population of 5,650 persons (1,765 adult males) The Falerna tribe was only founded in 318. It is assumed here that the 10,900 citizens who Afzelius claims populated this territory were still members of their old tribe.

[157] Although the figure of 5,000 is transmitted in several sources, there is some confusion about who was counted. According to Livy 2.16 and Dion. Hal. *Ant. Rom.* 5.40, they were adult males; Plut. *Pobl*. 21 suggest 5,000 is the total number of Sabines. The figure is accepted as authentic by several scholars e.g. Hantos 1983, 59. Such a result also fits rather well with *tribus* estimates for this Early Roman period based on census tallies of c. 2,000 adult males (on this see Ward 1990, 32, Table 6). However, these figures are seriously challenged by the arguments of Beloch (on this see Section 2.4 in this Chapter) and probably are best seen as anachronistic retrojections (in itself a possible clue to the size of tribes in later times). If indeed as Cornell 1995, 205-206 suggests, the Roman territory in this period could not sustain a population of more than 35,000 persons, the average *tribus* could not have contained many more than 500 adult males. Some support for this view is found in an obscure passage of Livy (4.46) which tells us that in 418 troops were raised from ten *tribus* selected by lot; from these the *iuniores* were enrolled. Since in that period the maximum mobilization appears to have been 6,000, each tribe sent a average of 600 *iuniores* (Cornell 1995, 192-193).

[158] From an administrative point of view (tribes were essential units for census, voting and from the third century also for the levy), it makes sense that some uniformity was aspired to (Broadhead 2008, 457-458). On the other hand, it is known that in the second century some tribes grew much more rapidly than the others (e.g. the Pollia).

[159] The size can be deduced from Afzelius' estimate that before the Latin War the *Ager Romanus* measured 2,005 sq. km (Afzelius 1942, 140), minus the 610 sq. km of the Ager Veientanus is 1395 sq km of old *Ager Romanus* divided among 21 tribes (66 sq. km per tribe). Ward 1990, 32 (Table 6) estimates smaller average rural tribes (54 sq. km).

2,000 adult males per new tribe result from Afzelius' statistics, which might be on the high side as Afzelius' calculations presuppose that territories were populated from their foundation as densely as they were at the time of the Gallic War of 225.[160] There is a strong possibility that in earlier periods the land was cultivated less intensively and that the colonists reclaimed ever larger areas as time passed.

At this moment we might conclude that there is little support for the view that 3,000 males on average participated in viritane colonization programmes of the late fourth century. According to the widely accepted demographic reconstruction produced by Afzelius, tribe populations were considerably smaller on average. Of course, his population estimates can be challenged (see discussion above), but it is difficult to improve on his method. In any case, on the basis of the information available at present, the tribes founded in the fourth century probably had slightly more than 2,000 adult males on average. This results in population densities comparable to those estimated for contemporary Latin colonies (10-15 adult males per sq km, on this see below).

Table 7: The sizes of Roman tribes according to Afzelius 1942

Tribe	Estimated area in sq. Km	Estimated population density per sq. Km	Population per tribe	
4 tribes of the ager Veientanus	610	48.2	7,351	2,297
Pomptina & Poblilia	392	48.2	9,447	2,952
Maecia & Scaptia	200	48.2	4,820	1,506
Falerna	225	48.4	10,900	3,406
Oufentina	120	48.2	5,784	1,806
Aniensis	200	28.9	5,780	1,806
Teretina	70	48.2	3,374	1,054

For size territories see: Veii: Afzelius 1942, 68 (but see Beloch 1926, 620 who estimates 562, accepted by Cornell 1995, 310). Pomptina and Poblilia: Afzelius 1942, 95 (also Beloch 1926, 620, but see Bozza 1939, 166). Maecia: Afzelius 1942, 96. Maecia and Scapta: (Beloch 1926 map II) Falerna: Afzelius 1942, 153, but see Beloch 1926, 620 who estimates 198 sq. km). Oufentina: Afzelius 1942, 93. Anienis (Beloch 1926 map II). Teretina (Afzelius 1942, 94), but see Beloch 1926, map II who estimates c. 100 sq. km. According to Taylor 1960, 57-59 Beloch and Afzelius place the tribe wrongly in the territory of Frusino. She argues for localization in the coastal territory between Liris and Volturnus (a territory of almost 300 sq. km.)

[160] On this see Section 2.5 in this chapter.

Table 8: Viritane distribution programmes and the creation of new tribes

Viritane distribution		**Tribe**			
Year B.C.	**Place**	**Date**	**Tribe**	**Location (Ross Taylor)**	**Created for**
393	Ager Veientanus	387	Stellatina,	Capena	New citizens and Roman settlers
			Tromentina,	Veii	
			Sabatina,	Lacus Sabatinus	
			Arnesis	Forum Clodi	
383	Ager Pomptinus	358	Pomptina	Suessa Pometia/ Ulubrae	-
None recorded, but Hernicians were defeated 358, which could have been followed with land confiscation and assignation		358	Poblilia	Northern part of Hernician territory. Extended in 306 with Anagnia	-
339	Ager Latinus	332	Maecia	Lanuvium	New citizens and Roman settlers.
		332	Scaptia	Velitrae	New citizens and Roman settlers
339	Ager Falernus	318	Falerna	Ager Falernus	-
339	Privernum	318	Oufentina	Privernum	-
None recorded, but Aequi were defeated in 304-302 which could have been followed with land confiscation and assignation		299	Aniensis	Anio valley	-
None recorded, but Aurunci were defeated in 314 which could have been followed by land confiscation and assignation		299	Teretina	Auruncian territory, coastal area from Liris to Volturnus	-
312	Calatia & Nola		Falerna	Extention of Falerna tribe	
303	Frusino		Oufentina	Extention of Qufentina tribe	
290	Sabinum	241	Quirina	Sabine/ Vestinian territory. Reate	Roman settlers and new citizens
Not explicitly recorded, possibly part of the land division programme of Dentatus		241	Velina	Ager Praetuttianus	Roman settlers and new citizens
232	Ager Gallicus and Picenum		enrolled in the Pollia.		
201	Samnium and Apulia			Unclear	Veterans
199	Ager publicus	-	Unclear	Unclear	Veterans
173	Ager Ligustinus et Gallicus		enrolled in the Pollia.		Romans and Latins

2.7. Summarizing

In this section, I have discussed some of the more concrete objections which have been raised to the reliability of Livy's colonial population figures. The argument that other literary sources give very different colonial population numbers was the problem tackled first. It appears that almost all available text-based demographic information is consistent with what Livy records. Only for the pre-Latin War period does a clear alternative tradition exist: that of the Sardinian colony reported by Diodorus. This colonial event is not described by Livy and if Diodorus' account is accepted as reliable, the smaller number of colonists might be attributable to its specific character (overseas colonization) to which fewer people were sent. The only competing figure for the mid-Republican period recorded by Dionysius, that for Venusia, can be reconciled with Livy's tradition by assuming that he included people generally left out of Livy's numbers (women and children or natives). Even if these attempts at reconciliation are rejected, the excessively high number and Dionysius' dubious reputation for reporting population figures, hardly challenge Livy's recordings seriously. Furthermore, I demonstrated that Livy's figures are not incompatible with other information in the literary sources on Roman manpower resources. This by no means proves Livy's tradition right, but it undermines some of the recent objections which have been raised against his reliability on this issue. This is relevant to the discussion in Section 4 which deals with the compatibility between the text-based demographic estimates and the archaeological data-set. Before such a comparison can be made, first Livy's figures have to be translated into rural population densities.

3. Translating Livy's figures into rural population densities

3.1. Population density

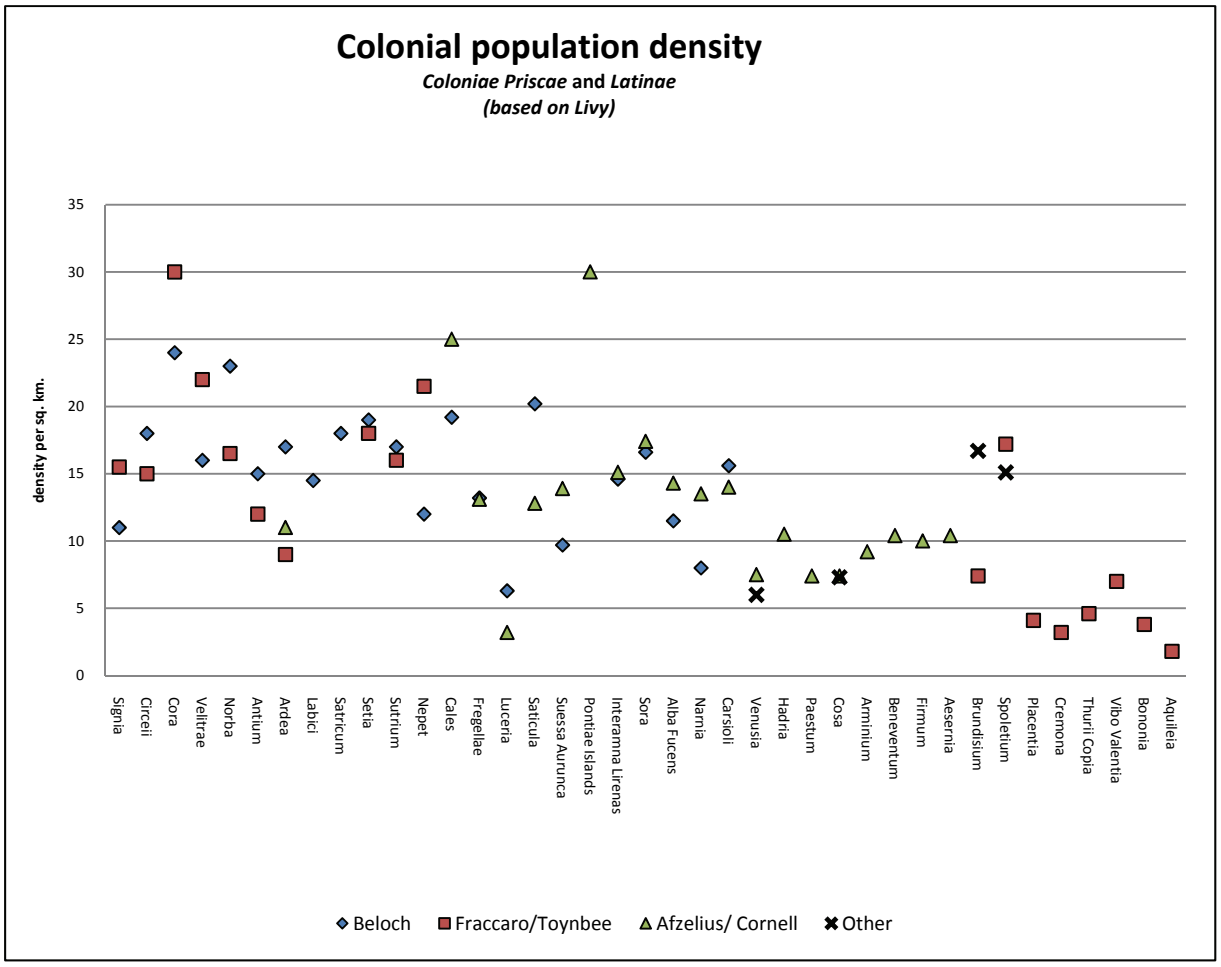
In order to translate Livy´s colonial population figures into population densities, a territorial variable is required. Although no specific information on the spatial dimensions of colonial territories exists in the literary sources, various scholars have attempted to make quite detailed territorial reconstructions of Italy during the Republic, differentiating clearly between Roman territory and that of colonies and allies. Fundamental in this regard are the studies of Beloch, Afzelius, Fraccaro and Toynbee,[161] who have used epigraphic and literary information (mostly not contemporary), medieval maps, probable natural barriers and traces of centuriation in their construction of geo-political maps of Italy during the Republic which are, with minor modifications, accepted by most scholars of Republican history.[162] On

[161] Beloch 1926, 620; Afzelius 1942 and Fraccaro 1935; Fraccaro 1956-1957; Toynbee 1965a Map 2 which is based largely on the works of the three previous cited scholars (see Toynbee 1965a, 595-597 for notes on his map).

[162] E.g. Brunt 1971, 54; Cornell 1995, 381; Scheidel 2006, 214. Recently also some attempts have been made to delimit colonial territories using Thiessen polygons (e.g. for the Pontine colonies Bouma and Van 't Lindenhout 1996-1997. For Nepet and Sutrium: Di Gennaro, et al. 2002; Di Gennaro, et al. 2008).

the basis of these reconstructions, Livy's figures for Latin colonies result in the following colonial population densities:[163]

Coloniae Priscae and *Latinae*



Graph 3: Density of colonists per sq. km. (*Coloniae Priscae* and *Latinae*).

[163] I have used the following calculation strategy: D (density) = P (number of colonists)/ T (territory). For colonists numbers (P), I have used Livy's figures (see Table 2 for figures). For colonies for which no information has been transmitted, I used the average number of colonists (e.g. 3833). For colonies founded before 338 for which Livy does not provided colonial population numbers, I have used the average of his other figures (e.g. 2166). For the territorial parameter I used the studies of Beloch 1926, 620; Cornell 1995, 381 (which is based on Afzelius), and Toynbee 1965a, Map 2.

Interestingly, the majority of the computations result in rather high, but not impossible population densities. If we accept a multiplier of 3.5 to calculate whole populations from Livy's figures (interpreted as adult males),[164] this results in total population densities of on average c. 50 persons per sq. km for the fifth and fourth centuries and densities in-between 35 and 10 persons per sq. km for the third and second centuries. This is below those recorded for these areas in the late nineteenth century (Graph 5), and perhaps more importantly, comparable to those calculated for the free population living on Roman territory in this period.[165]

The calculated densities also result in plausible amounts of land available per colonist. According to a convincing analysis of both ancient and more recent data of Foxhall, a farmer's family with a pair of oxen can cultivate a maximum of 3-5 hectares of land in a year.[166] Reckoning with some additional land left fallow in a crop rotation system, allotments one and a half times that size are sensible maxima. Indeed, the information to be found about colonial allotment sizes suggest that settlers seldom received larger allotments (Table 13). The minimum needed to sustain a family is usually put at 1.5 hectare.[167]

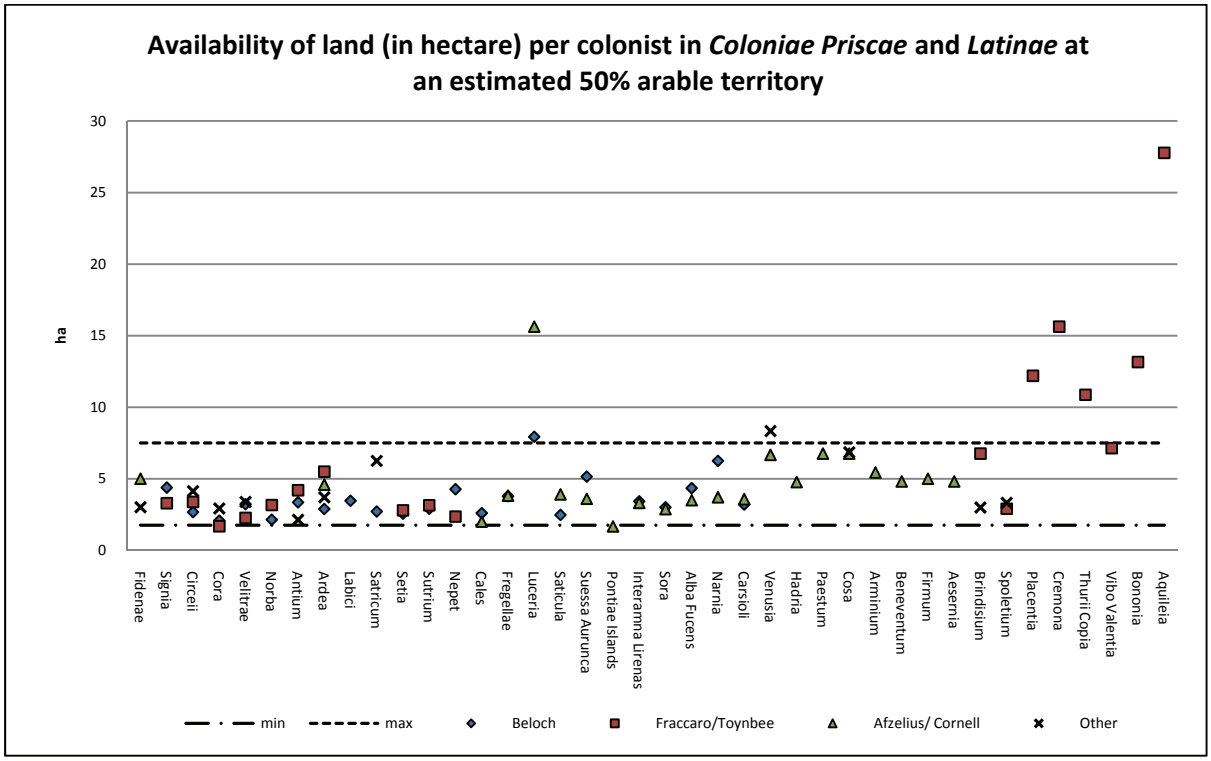
For the fifth and fourth centuries almost all calculated population densities fall within the range set in these studies. If we adopt a conservative estimate of 50% arable territory which is the roughly the figure calculated for the whole of Italy (thus including the substantial mountainous areas),[168] this results in allotments which are just above subsistence level (Graph 4, on average about 3.5 hectares per colonist). This is comparable to what the sources for this period suggest (eg. allotments of half that size are said to have been distributed in various viritane colonization programmes).[169]

These figures seem to imply that strong population growth could hardly be achieved in these territories. However, since the sources suggest that colonial territories suffered strongly from depopulation during the Republican period, this is not necessarily a problem.[170] Moreover, recent studies have convincingly argued that population levels in central Italy during the mid-Republican

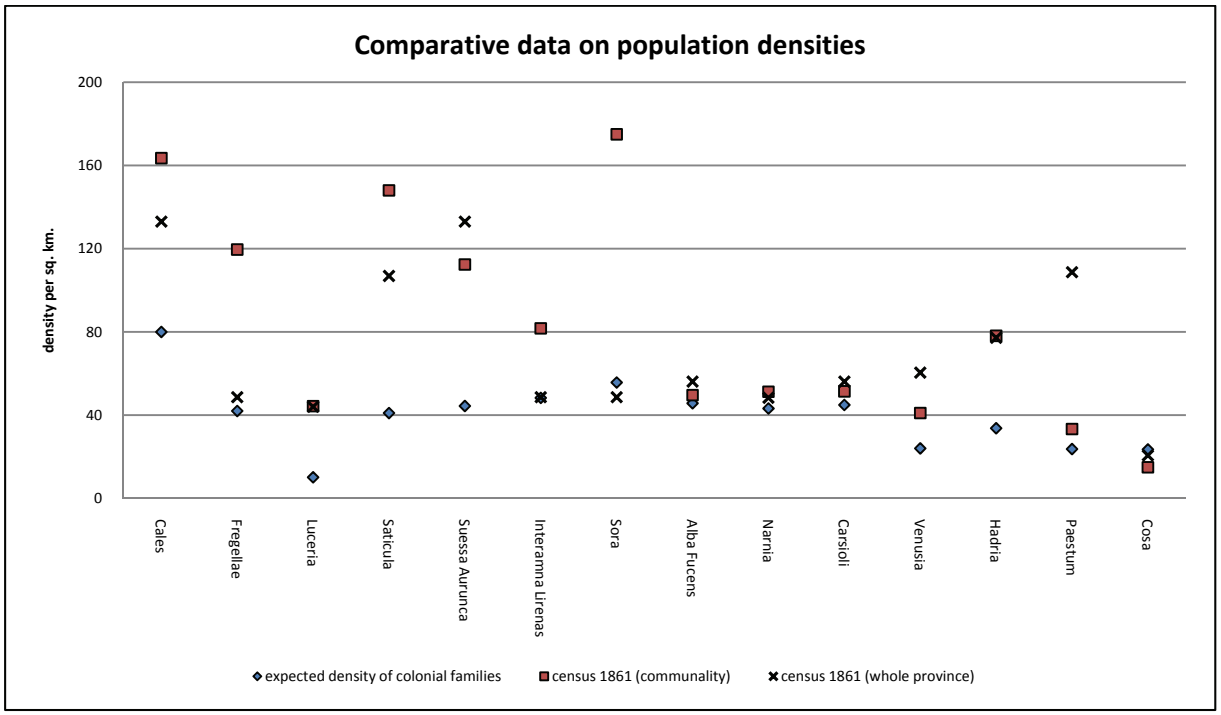
[164] On this section 2.2.4.
[165] Afzelius 1942, 128-134: for Latium on average 50 persons per sq. km, but about 100 persons per sq. km in the fertile Campanian plain; Brunt 1971, 54 arrives at 36 persons per sq km for the whole *ager Romanus*, but he also arrives at a lower estimate for the Latin territories. Population density estimates for the whole of Italy during the Early Empire vary considerably depending on the high or low count interpretation of the census figures. The figure calculated for the colonies correspond best with high count estimates for Italy (c. 56 free persons according to Lo Cascio 1999). However, as De Ligt 2010 has convincingly argued, the lower densities which result from a low count scenario are mainly the result of low population densities in the north of Italy. Even in a low count scenario population densities in central Italy are very high. See also Witcher 2008, 282-288 on population densities in the Roman *suburbium* during the Early Empire which are considerably higher than those calculated for the colonial territories. The colonial population densities are also comparable to those recorded for medieval Italy: 34 per sq. km in 1340, but 85 in Tuscany (Lo Cascio 1999, 169). For other comparative data see Jongman 1988, 67-76 and Blanton 2004, 214-215 who arrives at very high population densities for the Classical world.
[166] Foxhall 2003.
[167] On the minimum amount of land needed for a household see for example Salmon 1969, 72 n. 110, Galsterer 1976, 47 with further references.
[168] Cf. Jongman 1988, 76.
[169] See Table 13.
[170] Cf. Section 2.2.4.

period were close to the maximum carrying capacity of the area.[171] Nevertheless, since it is likely that colonial territories on average contained a higher percentage of arable land than the Italian average, the scenario sketched in Graph 4 may be too pessimistic. If we would use a more optimistic arable percentage of 70%, about 5 hectare of land per colonist would be available. If we also take into account that Livy's *coloni* probably did not all had reproducing families of at least two children,[172] this amount of available land is more than adequate. In such a scenario there would be room for population growth or the presence of a moderate indigenous population living within the reconstructed colonial borders. For the late third and early second centuries this was certainly a possibility. Even if we adopt the conservative estimate of 50% arable land, the potential amount of land per colonist systematically exceed that which could have been worked intensively by a single nuclear family. This trend is also discernible in the literary sources which describe the handing out of allotments of up to 50 *iugera* (Table 13 for references).[173]

[171] Lo Cascio 1999, 169; De Ligt 2010 for a demographic reconstruction of central Italy during the mid-Republican period.
[172] See Section 2.2.4.
[173] This, of course, cannot be used as an argument for the reliability of either one of these data-sets. There is a risk that historical information of allotment sizes and colonial populations has influenced territorial reconstructions. Nonetheless, the relationship is not absolute. Population estimates of, for example, Afzelius 1942 which are based on his territorial reconstructions are often very different from what Livy suggests about colonial population numbers or what can be inferred from allotment sizes (see esp. his estimates of Cales and Luceria).

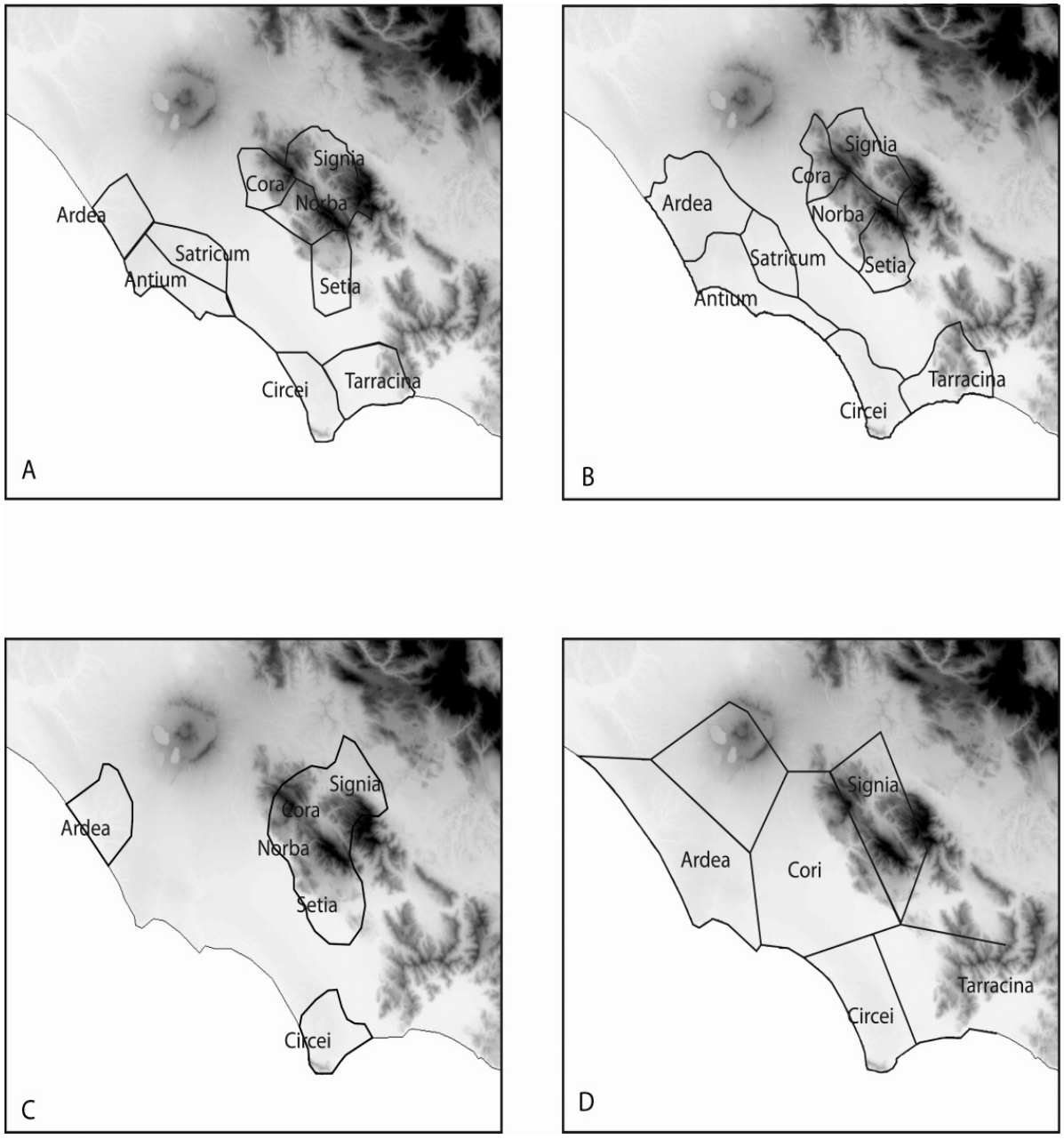


Graph 4: Availability of land per colonist in Coloniae Priscae and Latinae (upper dotted line = maximum amount of land a family can cultivate; lower dotted line = minimum amount of land to sustain a family).



Graph 5: Comparative data on population densities (number of persons per sq. km.).

Fig. 5: Reconstructions of colonial territories in Latium. (A = Beloch; B = Toynbee; C = Cornell; D = Bouma and Lindenhout)



Before drawing the conclusion that these statistics strengthen the credibility of Livy's figures, it is important to examine the data used in the calculations more closely. The parameters used to establish the availability of land per colonist, namely the size of colonial territories and the percentage of arable land, are not based on hard evidence, but are guesstimates which indubitably contain considerable margins of error. In the case of the sizes of colonial territories, this is demonstrated clearly by the fact that more often than not scholars disagree about their precise size and shape (Fig. 5). This is not surprising considering the weak evidential base of these territorial reconstructions which consists of very little more than anachronistic data shored up by plenty of guesswork.[174]

Nevertheless, it is still remarkable that, although there are considerable differences in the reconstructions of colonial territories, almost all are compatible with Livy's figures and result in population densities which remain within the thresholds for minimum and maximum amounts of land per colonist (excluding the colonies of the third and second centuries which will be discussed below).[175] This is significant only if there is certainty that the territorial reconstructions themselves have not been inadvertently steered by the literary information on colonial population sizes. In a couple of cases this supposition can be safely excluded. For example, in the cases of the colonies in the Agro Pontino and those founded in South Etruria territorial boundaries have been reconstructed using so-called 'Thiessen polygons' which use only the distance between polities as a criterion for defining territories (occasionally the size of cities is also included as a variable in these reconstructions).[176]

The methodology used by Beloch, Afzelius and Toynbee is less clear-cut and their demographic reconstructions are often based on a variety of elements which are not always clearly revealed (for example, distance between settlements, natural features, epigraphical evidence and medieval maps). In these studies, it is more difficult to exclude the possibility that demographic information has influenced their territorial reconstructions. However, the fact that the population densities calculated which result from these studies vary notably (from 30 to less than 5 per sq km) suggests at least that demographic information has not been the principal source of information on which the territorial reconstructions have been based. Most likely, in these studies the distance between polities was also the most important factor; especially in establishing where the territorial boundaries ran exactly other information such as the medieval maps, natural barriers and suchlike was used.

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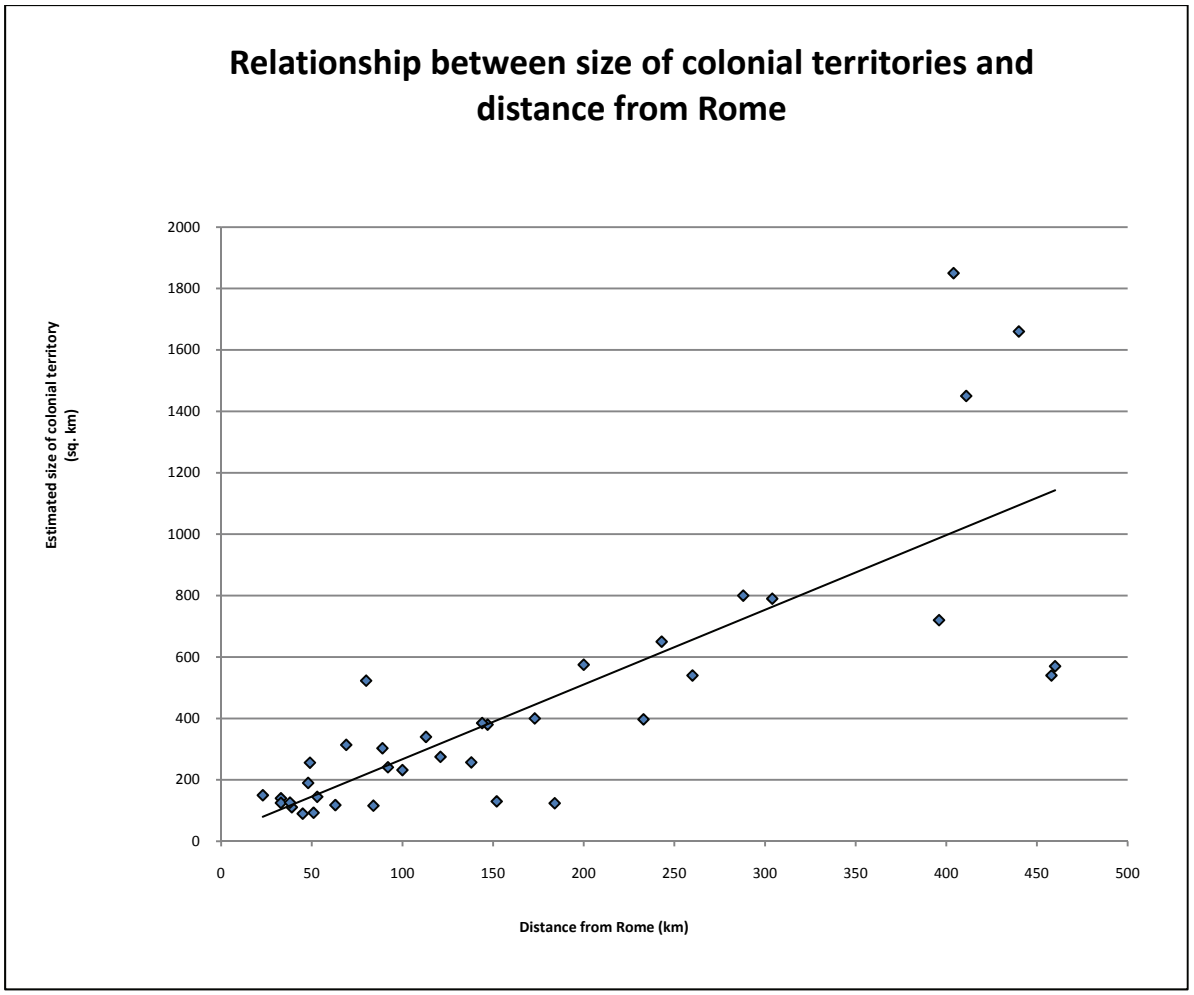
[174] The fact that during the municipalization of Italy in the first century the old territorial organization was significantly altered and that various rural areas were assigned to towns demonstrates that the late-Republican situation cannot simply be retrojected to the mid-Republican period, e.g. Beneventum whose territory increased considerably in the Late Republic (on this see Patterson 1988, 140-143).

[175] For example, according to the territorial allocation proposed by Beloch, all early colonial territories measured between 100 and 200 sq km. The vast majority falls in the category 100 to 150 sq km and only the territories of Signia and Nepet measured between 150 and 200 sq km. Other scholars (e.g. Afzelius 1942; Attema, et al. 2009, 49-fig. 5.0. who use different techniques) have proposed rather different territorial reconstructions. Although these alternative maps affect the size and morphology of individual colonial territories, they do not change the overall conclusion that most territories were between 100 and 200 sq km.

[176] Bouma and Van 't Lindenhout 1996-1997, 94; Di Gennaro, et al. 2002; Di Gennaro, et al. 2008.

As a general rule, territorial reconstructions which are based chiefly on inter-site distances are more likely to overestimate the sizes of territories than the other way around. Such approximations are the outcome of the fact that the scholars who construct them work with information on the location of known communities and try to establish where the likely boundary between polities lay. A crucial factor which can never be dismissed is the possibility that some ancient community either is not mentioned in the literary sources or has not been detected by archaeological studies (which would reduce the size of the territories of the neighbouring communities). Another drawback in this methodology is that it does not allow for the possibility there were considerable areas between settlements resembling transitional zones or no-man's lands which were not formally assigned to either one of the neighbouring communities.

It is likely that the impact of this factor increases the farther the colony is situated from Rome. The literary sources (still the prime source used for geo-political reconstructions) provide much more detailed information about the topography of ancient Latium, Etruria and Campania, than they do about the Po Valley, the Apennines and the inland areas of southern Italy. The distances between known polities in such regions are consequently considerably larger. The possible impact of this bias is demonstrated in Graph 6, which shows that there is a clear correlation between distance from Rome and the size of colonial territories reconstructed.



Graph 6: Relationship between the size of colonial territories and distance from Rome.

To some extent, this bias could explain the trend visible in Graph 3 which indicates a decline in colonial population density over time (in general the later colonies are founded farther away from Rome). Nevertheless, there is information in the literary sources which suggest that the trend towards bigger territories is at least partially authentic. First, Livy's information on the sizes of colonial allotments distributed shows that allotment sizes increased notably over time and in the second century were sometimes larger than an area which could have been worked intensively by a single nuclear family (Table 13 for references). If this information is genuine, it suggests that colonists either did not farm all the land they could intensively or that other people worked these fields.[177]

[177] For the early colonial period, still dominated by the threat posed by the indigenous populations, the latter option looks unrealistic. Much of the land in the Po Valley probably had to be reclaimed and drained. It therefore needed heavy investment before it could be farmed intensively. Therefore it is likely that, at least initially, a considerable proportion of the colonial lands were exploited only extensively, possibly for animal husbandry as has been suggested for Aquileia (Bandelli 1983-1984).

Livy also seems to suggest that large tracts of conquered land remained undivided and were either kept for future distribution or assigned to the indigenous population.[178] In the case of Thurii, Livy explicitly states that a third of the confiscated land was set aside for future distribution.[179] There is no explicit literary information which suggests that over time more land was left undivided (which would explain the trend of the increasing size of colonial territories), but it is reasonable to assume that, especially after the Second Punic War, Rome acquired more land than it could distribute among available colonists and tracts of land were reserved for other purposes such as future distribution programmes.[180]

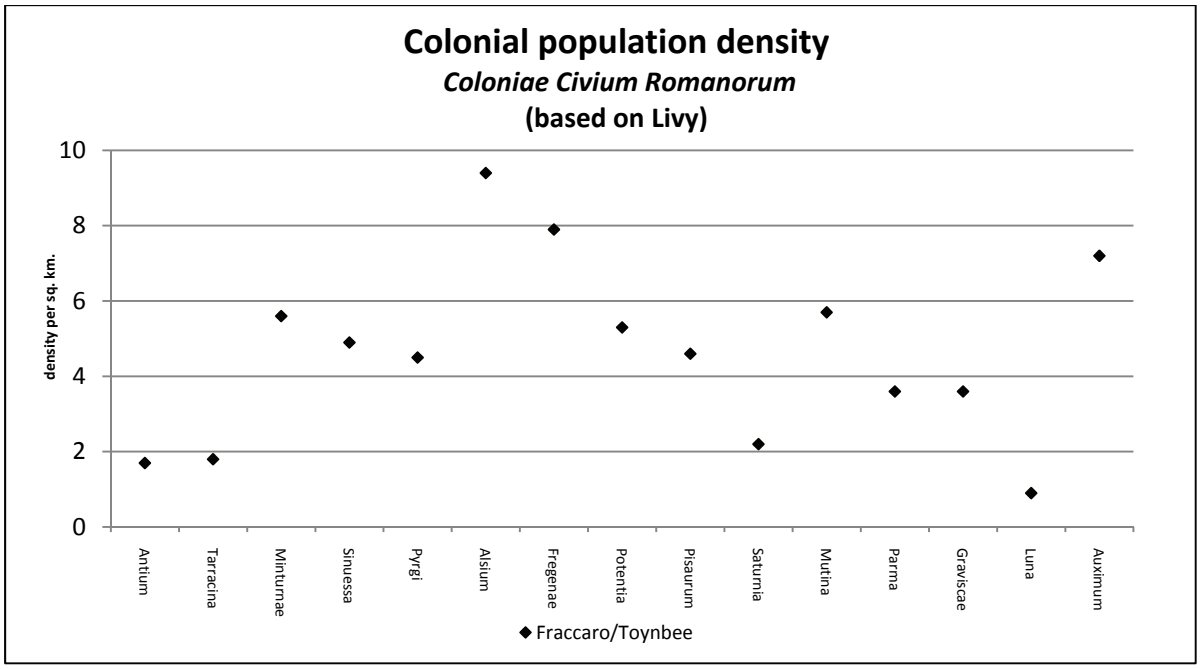
Coloniae Civium Romanorum

Puzzlingly low population densities are also obtained for citizen colonies (Graph 7).[181] Citizen colonies founded in the second century have about the same colonial population densities as the Latin colonies founded in that period but the sources record large differences in the size of holdings distributed (Table 13). The holdings of Roman colonists fluctuate between 5 and 10 *iugera* (1.25-2.5 ha), hence 5 to 10 times smaller than what is suggested by the calculation in Graph 8. The fact that the allotments distributed teeter on the edge or are even below subsistence level suggests that in Roman colonies additional (arable) land was available for colonists. However, the likely availability of additional lands cannot be the sole explanation of the low densities. There is also reason to believe that many of these colonized territories were considerably smaller than they were after the municipalization process (attributable to the same processes discussed above for the Latin colonies).[182]

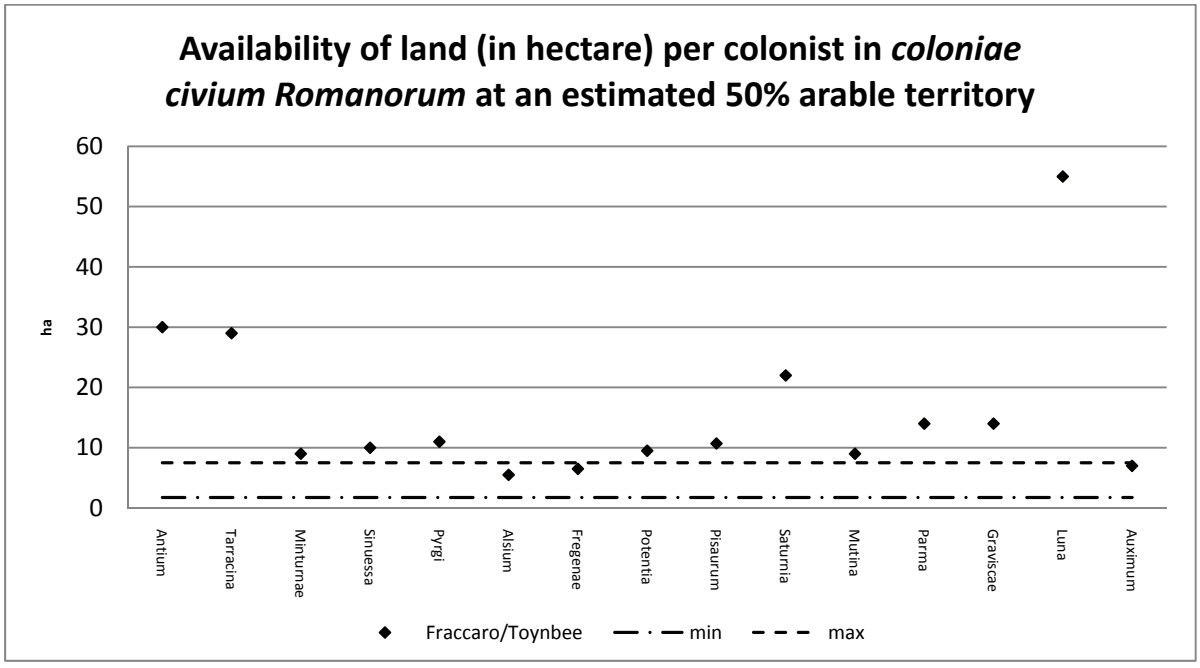
The literary tradition suggests that the 'maritime colonies' had very small populations which also possessed little land as private property. Nevertheless, it is often believed that their territories were fairly extensive, comparable in size to those of the Latin city-states. On Beloch's map, for example, Minturnae and Sinuessa are given territories of little less than 100 sq km, while Terracina and Antium have territories between 150 and 200 sq km. On Toynbee's map the territories of Minturnae and Sinuessa are smaller, between 50 and 60 sq km, while those of Terracina and Antium, although shaped differently, are in the same order of magnitude. More recent studies generally avoid the step of making territorial estimates for these communities and

[178] See, however, Chapter 5 for the view that these undivided lands were not assigned to the colony, but remained property of Rome.
[179] Livy 35.9.
[180] This is in fact recorded for the territory of Vulci. After the conquest, a part of the confiscated territory was used to found the colony of Cosa. However, enough land remained unoccupied so that Rome later could found the colonies of Saturnia and Heba.
[181] I used the same calculation strategy as I used for establishing population densities in Latin colonies. For colonial population numbers (P), I used 300 for the so-called maritime colonies (based on Livy) and 2,000 for the so-called agrarian colonies (also based on Livy). Only a few scholars give estimates for the sizes of the territories of citizen colonies. For this graph, I have used the estimate of Toynbee 1965a, Map 2.
[182] A good example of this comes from the Latin colony of Cremona. Recent studies of the settlement patterns and centuriation systems in the *Ager Cremonensis* have argued that a considerable part of the territory was settled intensively and parcelled out only in the late Republican period (Vullo 1995).

simply locate them on Roman territory in the area of a certain *tribus*.[183] It is indeed doubtful whether maritime colonies did possess territorial sovereignty before the municipalization of Italy and there is a good chance that they were not only politically, but also in a territorial sense part of Rome.



Graph 7: Density of colonists per sq. km. (*Coloniae Civium Romanorum*).



Graph 8: Availability of land per colonial family (*Coloniae Civium Romanorum*).

[183] E.g. Cornell 1995, map 9.

3.2. The percentage of Livy's colonists who could have fitted inside the colonial oppida

In terms of settlement organization, ancient rural societies are generally divided into two categories: either, farmers are supposed to have lived predominantly in large nucleated settlements and walked considerable distances to reach their fields, leaving the countryside relatively empty, or those who lived dispersed over the countryside close to their farmlands.[184] Although a real agro-town system characterized by desolate rural landscapes similar to those which developed in southern Italy in the Medieval period probably did not exist in ancient Italy,[185] it is generally accepted that in various areas of pre-Hellenistic Italy a large proportion of the farming population did live in cities.[186] This was probably the situation in the Greek and Etruscan city-states from the Archaic to the Early Hellenistic period.[187] Generally speaking, the cities of these communities were very large and are thought to have contained up to 80 per cent of the total population. Other regions in this period, such as Latium and the Messapian Peninsula, are characterized by smaller cities which were located quite close to each-other allowing the majority of farmers to have an urban base.[188]

According to the influential investigations of Garnsey, the balance between town-based and country-dwelling farmers altered significantly in the mid- and late Republican periods.[189] Cities were transformed from being residential areas into more administrative centres which housed only the elite and possibly some farmers who had their lands in the vicinity of the town.[190] In his view, this process of de-nucleation was strongly influenced by Roman land distribution programmes and colonization which encouraged settlement in the countryside. That most Roman farmers were expected to have a rural base is demonstrated by the fact that the size of Roman colonial urban centres was usually too small to contain a large population.[191] He argues that by and large no more than 20-30 per cent of the colonists is likely to have had an urban base.[192]

His argument is widely accepted by ancient historians and in most demographic models the urban population of Italian communities in the mid- and late Republican period is estimated at between 10 and 20 per cent of the total.[193] Despite this consensus, the idea of Roman colonies

[184] Duncan Jones 1974 Chapter 6; Garnsey 1979-1980.
[185] Garnsey 1979-1980.
[186] For the Roman world see Bekker-Nielsen 1989, 20-32 who argues, on the basis of the close distance between cities in Central Italy in the 1st century AD, that farmers in this period probably lived in agro-towns. For other ancient communities see notes below.
[187] For the Greek city-states see Hansen 2006, 37-47; Carter 2006, 209 on Metapontum, and Bintliff 1997 for a parallel in Boeotia. For a good example of the Etruscan world, see Perkins 1999, 113-114, Table 10.8 and fig. 10.7. The urban-rural split is estimated at 70-30%, based on a combination of field-survey data and information about Etruscan city size. See Perkins 1999, 108-109 with references to higher urban population estimates which results in higher urbanization rates.
[188] For Messapian towns, see Burgers 1998. Using this research and the excavated house plans, Yntema 2008, 381-382 estimated that the urbanization percentage was over 80% (see his Table 1).
[189] Garnsey 1979-1980.
[190] Garnsey 1979-1980, 15-16. see also Gabba 1994, 186 for a similar view.
[191] Garnsey 1979-1980, 13-15.
[192] His conclusion is based on the earlier studies of La Regina 1970-1971, 451-2) on Aesernia and Alba Fucens, and Tozzi 1972, 16-21) on Cremona, who demonstrated that the number of colonists mentioned by Livy could never have fitted inside these colonial town centres. In the case of Cremona, Tozzi calculated that about two-thirds of the colonists had to live outside the city proper, a figure which Garnsey argues must be raised since the assumed 320 persons/ha estimate used by Tozzi is probably too high; he argues that 150 persons/ha or lower is more plausible.
[193] Both high and low counters accept such an urbanization rate. See Lo Cascio 1999, 164-166 and De Ligt 2008a.

organized on the agro-town principle occasionally re-emerges in the discussion about colonial settlement organization; especially in an attempt to explain the relatively empty rural territories which have been encountered in various surveys.[194] Therefore, it seems a worthwhile exercise to re-examine Garnsey's arguments in the light of these new studies, taking into account the vast amount of new data on colonial *oppidum* sizes and urban settlement organization which has become available since the publication of his influential article.

Oppidum sizes and urban population estimates

In order to calculate likely urban population sizes, two variables are needed: urban population densities and the sizes of urban centres. I shall commence with a discussion of the first variable. Urban population densities do tend to vary markedly, not only over time, but also between coeval cities.[195] In Republican Italy, for which no written records about the size of urban communities exist, this means that all estimates have to be based on archaeological data.[196] The margins of error in such estimates are considerable.[197] Probably the best evidence for colonial urban population densities comes from Cosa. Decades of excavation have uncovered a large enough area to enable a fairly accurate reconstruction of the town plan. In the early second century the city of 13.25 hectares contained twenty-four larger and 224 smaller houses (See Fig. 2).[198] Since the town was founded as a colony and was sent a supplementary batch of colonists in the early second century, it seems reasonable to assume that each small house represents a family (c. 6 persons),[199] and every large house had a population twice that size. If these estimates are correct, a maximum population of 1,632 persons is obtaind, that is121 persons per hectare.[200] Excavated house plans of the second century in other colonies are more or less of the same size as those of Cosa, which suggests that the calculated urban population density also applies to most other colonies of this period.[201]

It is important to remember that these conclusions are based on excavated domestic architecture and urban settlement organization which all date to the second century. The stumbling block is that the second century situation is not necessarily representative of that which existed in the

[194] See for such an explanation of the missing sites problem: Hayes and Martini 1994, 36; Attolini, et al. 1991, 144 and Arthur 1991, 100.
[195] In Medieval Italy, for example, urban population densities varied between 100 and 500 persons per urban hectare (cf. De Ligt 2008a, 149-150). Much depends on available space, on technological innovations, on social structures and on cultural processes.
[196] See Duncan-Jones 1975, 260 n. 4 for recorded figures for ancient cities; none regards Italian cities.
[197] Wallace- Hadrill 1994; Morley 2008, 122-123. Estimates can differ by a factor of 3.
[198] Fentress 2003, 24.
[199] See for a discussion of Roman family sizes Witcher 2008, 285-288.
[200] De Ligt 2008a, 151-152; Brown 1980, 18 estimates 1,100 inhabitants. Note that the estimated household size of c. 6 persons is considerably higher than the multiplier of 3.5 used to calculate total populations from colonists (interpreted as adult males, see Section 2.2.4.). This results from the fact that a household is likely to have consisted of more than one colonist. Especially fathers, sons and brothers may have lived together and shared an urban house for a while (see Hin 2008, 199 for likely percentages of Roman *iuniores* with living fathers and Tacoma 2006, 47-48 on the fact that in Roman Egypt more households could share one house). The aim here is to establish the likely *upper limit* of urban population densities which can be used to calculate the *maximum* number of colonists who could have lived in the urban centre.
[201] See Pesando 1997, 275-320 and Sewell 2010, 87-137 for good overviews of houses in Latin colonies. For the colonial houses at Capo Colonna measuring c. 510 m2 see Ruga and Spadea 2005, 317-318 esp. n. 12. See for other examples and arguments also De Ligt 2008a, 152-154 with references.

earlier phases of colonial towns. Regrettably, very little is known about the urban lay-outs of colonial centres in this pioneering period as they have been cloaked by the monumentalization phase of the post-Hannibalic period.[202] The little archaeological evidence available about them does suggest that, in their early phase, colonial town centres were less densely populated and that there were large empty spaces within the town walls. The excavated houses of the early second century in Cosa, for example, seem to have been built on virgin soil, which suggests that the city had not been fully built up in the previous early colonial period.[203] Similarly, surveys carried out inside the town walls of Interamna Lirenas and Cales suggest that their settlements in the third century did not cover the entire walled area. The majority of black gloss ceramics found are from the second century and most of the early material is found in restricted areas of the town, often connected with cultic contexts.[204]

Archaeological research in other, non-colonial urban centres of the fourth and early third century also suggests that cities in this period were only partially used for domestic purposes. Recent studies in Pompeii have shown that the fortified city (65 hectares) of the fourth and third centuries was sparsely populated and that agriculture was pursued inside the town walls. [205] On the basis of these observations, it seems reasonable to assume that early colonial cities were not very densely settled and that it is unlikely that they exceeded the 120 persons per intramural hectare which was calculated for second-century Cosa.

[202] In the Latin colony of Fregellae only one possible elite residence can be dated to this period, but in all other cases excavated urban residences date from the beginning of the second century and thereafter. For the houses of Fregellae see Coarelli and Monti 1998, 62-65.
[203] Only a very limited amount of black gloss ceramics dating to the early colonial phase (i.e. the third century) has been encountered. See Taylor 1957 for a study of the black gloss pottery of the early excavations; for the black gloss ceramics recovered during the recent excavations see http://www.press.umich.edu/webhome/cosa/ (last accessed 9-3-2011).
[204] For Cales see: Pedroni 1986; Pedroni 1990. Of the 17 locations where material is collected, only 5 had clear late fourth- and third-century pottery. Three of those are clearly connected with cultic activity (around the temple area; on the *arx* and in the votive area loc. Ponte delle Monache), two are secondary deposits (fill of city wall). There is an interesting correlation between the find spots of pre-Roman and early colonial material. For Interamna see Hayes and Wightman 1984; Hayes and Martini 1994, 38 and 138-145.
[205] Nappo 1997; Pesando 1997, 12-27.

Coloniae Priscae

Table 9: Walled area of *Coloniae Priscae*[206]		
< 15 hectares	**20-25 hectares**	**35-45 hectares**
Setia (12)	Cora (20.4)*	Fidenae (45)
Sutrium (*c*. 7.5)*	Antium (23)	Signia (*c*.49)*
Nepet (14.5)*		Norba (37.2)*
		Ardea (40.5)*
		Satricum (36.6)*

Judging by their size, the *oppida* of the old colonies which were founded before the Latin War can be divided in roughly three categories (see Table 9). If it is assumed that these colonial centres were as densely populated as Cosa was in the second century, this would imply populations of *c*. 5,000 people for the largest category of cities, *c*. 2,500 for the middle class towns and *c*.1,300 for the smallest *oppida*. However, this seems very unlikely. As I have discussed above, there is very little evidence for densely populated cities in this period. In Satricum, for example, decades of archaeological excavation have not yielded any traces of colonial urban dwellings but numerous graves dating to the fifth and fourth century have been found inside the town walls, indicating that the town was certainly not fully built-up in this period.[207] As a rule, Archaic towns often have large non-built up areas inside the fortified walls and often less than half of the intramural area was used for domestic or public buildings.[208] Therefore, it is a reasonable assumption that the colonial *oppida* of this period were sparsely settled. On the basis of an estimated built-up area of 50 per cent, the dimensional categories of colonial *oppida* listed above roughly correspond to populations of respectively 500-750, 1,250 and 2,500 persons (that is, 150-250, 375 and 750 colonial families).

[206] Sizes marked with an asterix are based on Lackner 2008, 240-243. For Setia: Attema 1993, fig. 22; Fidenae: Miller 1995, 318; Antium: Sommella 1988, fig. 3. The town is slightly smaller in the reconstruction of Guaitoli 1984.
[207] Gnade 2002.
[208] Bekker-Nielsen 1989, 30. For a good example of the Etruscan world, see Perkins 1999, 108-114. For the Greek cities see Hansen 2006, 37-4. For Messapian towns, see Burgers 1998. Intramural survey demonstrated that probably about 50-60% of these cities was used as domestic space. In general on the urban planning of early Republican colonies see Termeer 2010, 47-48.

Coloniae Latinae

Table 10: Walled area of *Coloniae Latinae*[209]			
< 15 hectares	**30-40 hectares**	**60-80 hectares**	**100> hectares**
Narnia (*c*.11.9)*	Firmum (30)*	Cales (61.2)*	(Beneventum) (100)
Aesernia (9.6)*	Suessa Aurunca (33)*	(Hatria) (70)	Paestum (120,4)*
Spoletium (*c*. 16)*	(Interamna Lir.) (30-40)*	Sora (*c*.71)*	(Luceria) (195)
Cosa (13.5)*	Alba Fucens (34)*	Fregellae (*c*. 81,6)*	Vibo Valentia (*c*. 200)*
	Venusia (20-42)	(Interamna Lir.) (70)*	
	Ariminum (46.5)*	Brundisium (*c*. 80)*	
	Beneventum (42-44)*	(Luceria) (70)*	
	Placentia (42.2.)*		
	Cremona (30.7-46)*		
	Bononia (*c*.50)*		
	Aquileia (30.4-44.4)*		
	(Hatria) (*c*. 37)*		

In the case of the Latin colonies founded after the Latin War, it is possible to discern four dimensional categories. On the basis of a 120-persons-per-hectare estimate, the populations of these centres would have fallen within the four following bands, 1,000-1,500, 3,500-5,000, 7,000-10,000 and > 12,000 souls. Again, it is unlikely that such figures were actually achieved. As said above, very few traces of habitations dating to the pre-Hannibalic period have been recognized in colonial *oppida*, which makes it unlikely they were as densely populated as Cosa was in the second century.[210] Moreover, most of the larger *oppida* were not created at the time of the foundation of the colony, but are of pre-Roman origin and it is doubtful if the colonists filled up the whole intramural area.[211] In fact, in most of the cases investigated it seems that only a limited area inside these pre-Roman fortifications was actually inhabited in Roman Republican times.[212]

The situation in the colonies founded in the Greek cities (e.g. Poseidonia, Thurii and Vibo) is more complex. Before the Roman conquest, these very large cities were not fully built up and vast

[209] Sizes marked with an asterix are based on Lackner 2008, 240-243. For the 70 hectares of Hatria see Guidobaldi 1995, 199 and Azzena 2006; the 100 hectares of Beneventum results if the Cellarulo area is included (Giampaola 1991), tav. V; For the 195 hectares of Luceria see Lippolis 1999, fig. 1.

[210] See above.

[211] For example, in Cales and Hatria clear traces of an indigenous phase have been recognized inside the colonial town centre (Pedroni 1986, Pedroni 1990, Martella 1998, 48 with further references). Furthermore, recent excavation of the walls of what might have been the Latin colony of Saticula has clearly shown that it was fortified well before the Roman period (De Vito and Di Maio 1998. The wall was enforced in the later third / early second century). Likewise, in the case of Luceria it is very implausible that the Roman colonists built a city-wall which enclosed an area of 195 hectares. Large fortified enclosures are a typical Daunian phenomenon (e.g. Arpi, Herdonia) which suggests that the walls of Luceria belonged to the pre-Roman phase of the city. The walls of Brundisium are also of a pre-Roman date (see Burgers 1998). In the case of Fregellae, however, it has been argued that the new colony, although it borrowed its name from the conquered town, was founded *ex novo* on a different location (Coarelli and Monti 1998, 47-48).

[212] For Luceria see Lippolis 1991; Mazzei 2001; Quaranta 2002. The theory that only a restricted part of the city (<50 hectares) was inhabited in Roman times is based on the fact most Roman finds are found in a limited area of the town in which a remarkable orthogonal pattern (measuring c. 38 hectares) is also recognizable in the current street-grid. However, the identification of the colonial centre with this orthogonal grid is rather doubtful since the latter has not been properly dated. A pre-Roman date for the grid cannot be excluded since there is ample evidence that orthogonal town planning was already *en vogue* in Italic communities before the Roman period. For Fregellae, on the basis of a different orientation of the street grid, it is argued that the early colonial settlement was confined to the south of the city area (Crawford, et al. 1985, 84).

empty areas could be found in them.[213] What happened to these cities when a colony was founded there is still poorly understood, but there are strong reasons to assume that a considerable part of the indigenous population continued to reside in these cities after colonization.[214] If this means that these cities became more crowded as a result of the arrival of migrant colonists is difficult to say at the present state of research. Paestum seems to have flourished after its colonization, but the construction of an amphitheatre in the centre of the town during the Late Republic could suggest that it was not fully built up in that period.[215] In Thurii, the archaeological record seems to attest to a contraction of the population of the city after the Roman colonization. Scholars have identified a second wall circuit dating to the first century which delimited an area of just 50 hectares of the former Greek city. Most of the material dating to the Roman period also comes from this area.[216] In Vibo, traces of a fortification wall dated to the later Republican period have also been identified inside the larger pre-Roman fortifications, which might testify to a reduction in the size and population in this city.[217]

[213] See Hansen 2006, 37-47.
[214] See Chapter 5. Especially in Paestum, the evidence for continuity between the Greek-Lucanian phase and the Roman period is very strong (E.g. Greco 1988; Torelli 1999, 45; Crawford 2006). Similarly, archaeological investigation inside the 200 hectares large city walls of the Greek/ Bruttian city of Hipponion-Vibo, which received a Latin colony in 192, also seems to suggest that the original population was not entirely evicted (Iannelli and Givigliano 1989, 678).
[215] In the case of Paestum some scholars even suggest that the original Greek/ Lucanian town was enlarged by c. 50 hectares after the foundation of the colony (e.g. Greco 1988, 82 and page 80 fig. 1). This hypothesis has been rejected in more recent studies (see Lackner 2008, 139-140 for an overview of this debate).
[216] E.g. Greco, et al. 1999; Carando 1999. See Chapter 5 for a discussion of the recent theory of Caruso 2004 that the city of Thurii was not the administrative centre of Copia.
[217] Perotti 1974, 132; Iannelli and Givigliano 1989, 637. In the lower part of the city of Vibo, an orthogonal street grid has been recognized which is considered to have been the colonial settlement. Apparently the grid was based on the Roman *actus*, which is believed to suggest a Roman origin (See Aumüller 1994, 241-278 for a study of the wall and a good map of the town, with 'Roman' street grid. Since the grid is not properly dated, and the reorganization of towns in an orthogonal fashion continued in the late Republican and early Imperial period, the connection with a colonial settlement is not very solid. Furthermore, the street grid of Paestum is also based on a measurement unit which corresponds to the *actus* (35 m.), but which is dated in the archaic period (Lackner 2008, 140).

Coloniae Civium Romanorum

Table 11: Walled area of *Coloniae Civium Romanorum*[218]

2-3 hectares	**5-6 hectares**	**7-10 hectares**	**18-25 hectares**
Ostia (2.4)*	Croton (*c.* 5-6)	Sena Gallica (*c.* 7-10)	Sipontum (*c.* 20)*
Minturnae (2.2)*	Terracina (*c.* 5-6)	Castrum N. Pic. (8/15)*	Potentia (19.9)*
Puteoli (3)*	(Buxentum) (*c.* 5-6)	(Buxentum) (9,3)*	Pisaurum (*c.* 18.5)*
	Pyrgi (*c.* 5.5)*	Volturnum (7)*	Saturnia (25.6)*
		Tempsa (*c.* 12)*	Parma (26.2)*
			Luna (24.6)*
			Salernum (18)*

As a rule the walled areas of Roman colonies are small. The earlier citizen colonies of the maritime type are characterized by very small rectangular *castrum*-like fortifications which enclosed areas of either 2-3, 5-6 or 7-8 hectares (see Table 11). Based on an estimate of 120 persons per hectare, which seems reasonable for the second-century colonies at least, this result in population sizes of 300, 600 and 900 persons. The citizen colonies founded after 184 are larger, but still small in comparison to most Latin colonies; all have about the same size (between 20-25 hectares) and could probably have housed a maximum of 2,500-3,000 people.

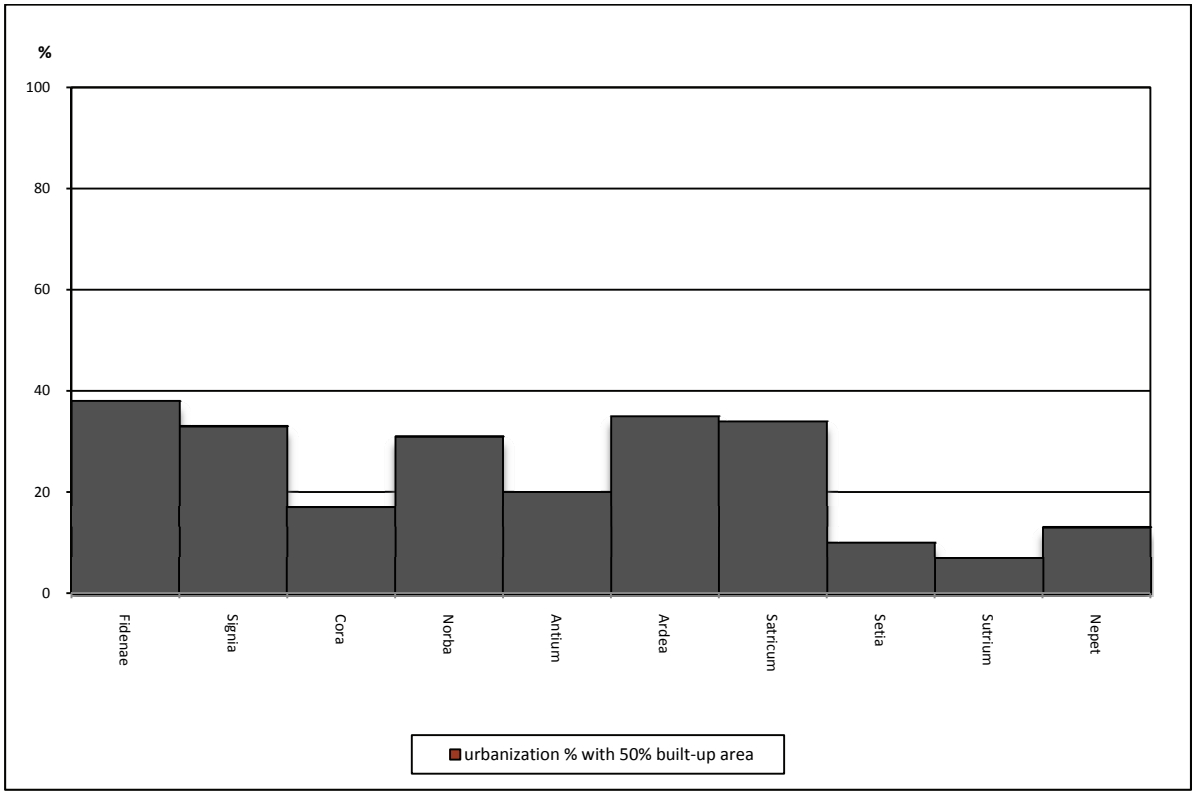
Maximum urbanization percentages

Taken as a whole, the archaeological evidence on colonial cities and their likely populations discussed above strongly supports Garnseys initial thesis that in most Roman and Latin colonies only a small percentage of the total number of colonists mentioned by Livy could have had an urban base. For colonies founded before the Latin War, the combination of the literary data and the archaeology of colonial *oppida* suggests that urbanization rates remained well below the 50 per cent mark and that in most cases even less than 30 per cent of the total population could have resided inside the town walls (Graph 9). These percentages must be considered theoretical *maximum* figures and in several colonies (as, for example, Satricum) the real urbanization percentage is likely to have been considerably lower.

A similar picture emerges in the Latin colonies founded after the Latin War (Graph. 10). Although the graph shows more variety and high urban population rates are possible in a couple of instances, in most cases it is unlikely that such urbanization percentages were actually achieved (cf. above). In these colonies most calculated urbanization rates also fluctuate between 20 and 30 per cent. The maximum urbanization rate of between 40 and 50 per cent calculated for the last two Latin colonies founded might reflect a genuine trend. The town walls were very probably constructed not

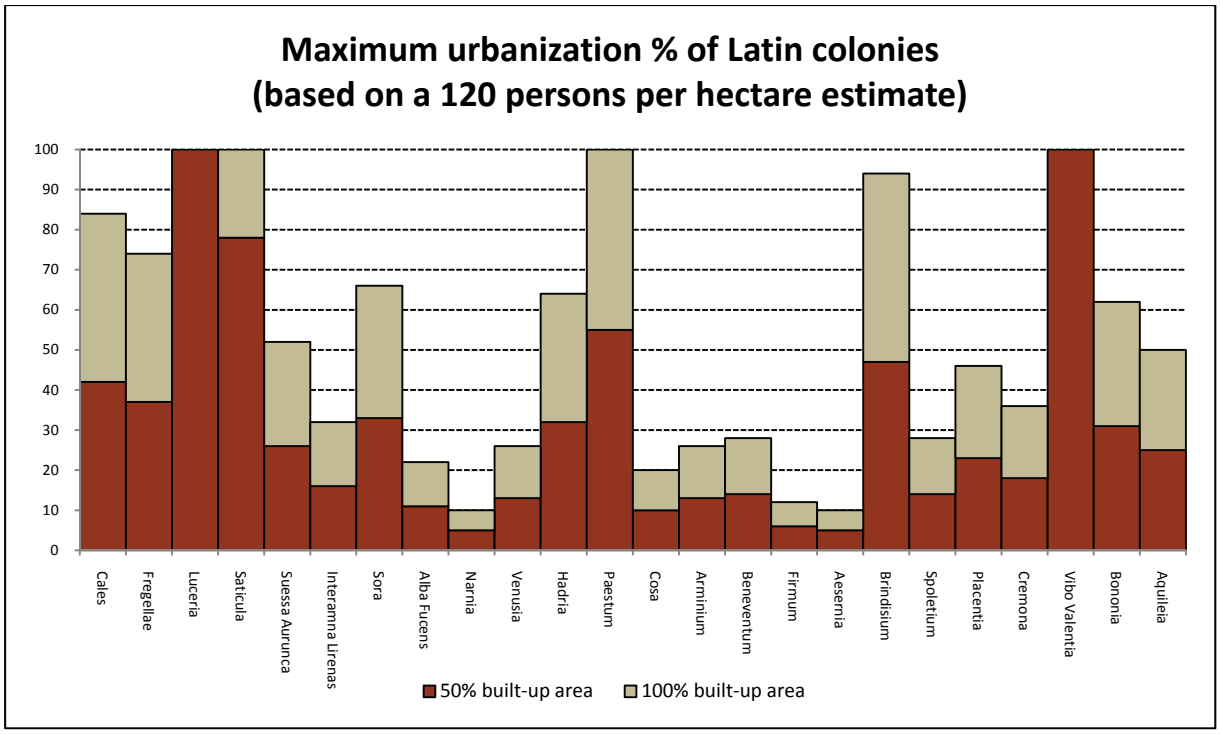
[218] Sizes marked with an asterix are based on Lackner 2008, 240-243. Croton: Sommella 1988, fig. 2; Terracina: no clear plan is known, but see Sommella 1988, fig. 64 for a rough estimate of the probable town size; Buxentum: Gualtieri 2003, fig. 23. The Greek Lucanian town is larger (9.3 hectares), an orthogonal street grid, believed to be indicative of the Roman colony, is only visible in a restricted part of the town (c. 5 hectares). Sena Gallica: Sommella 1988, fig. 20.

much later than the foundation of the colony and if, as seems likely, they were organized in the same manner as the better investigated colonies of the same period, there is no reason to lower the anticipated urban population density. It is interesting that citizen colonies founded in the same period have a similar urbanization percentage. Citizen colonies founded after 184 are all about the same size (between 20-25 hectares) and could probably have housed a maximum of 40 to 50 per cent of the total number of 2,000 colonists recorded in the sources. The small maritime colonies could have housed in-between 33 and 100 per cent of the fixed population figure of 300 souls recorded in the sources.[219]



Graph 9: Maximum urbanization % of colonies founded before the Latin War.

[219] At first sight, this calculation sits uneasily with a passage in Livy which states that settlers in maritime colonies during the Second Punic War had to take an oath not to sleep outside the walls for more than 30 days as long as the enemy was in Italy (Livy 27.38). This seems to suggest that all colonists had a place to sleep inside the colonial *oppidum*. Of course, this does not necessarily imply that they all owned urban houses, as they could have had only some provisional sleeping arrangements for wartime. This seems to be supported by another passage in Livy (22.14) which describes how, during the Second Punic War, Fabius saw the enemy burning down the colonial farmsteads in the territory of Sinuessa (which are explicitly described as their homes).



Graph 10: Maximum urbanization % of Latin colonies (based on a 120 persons per hectare estimate).

Summary

New archaeological evidence about the sizes of colonial *oppida* seems to confirm Garnsey's initial thesis that most Roman colonists had a rural base. The information available about urban architecture and city planning suggests that urban population densities increased in the course of the third and second centuries, but even then probably did not exceed 120 persons per hectare. The earlier periods will remain a conundrum until more research is done, but the sparse evidence available, especially information from other coeval Italian cities, suggests that towns were not fully built up and that the population per hectare of walled space was about half as dense as in later periods. This implies that most colonial *oppida* could not have accommodated more than 20-30 per cent of the colonial population recorded in the sources. Possible exceptions were those colonies which were founded in the second quarter of the second century, the maritime colonies and some of the early fourth century colonial settlements which might have had urbanization percentages of 50 per cent or more.

3.3. Proportional differences between population and size of oppida in Latin and citizen colonies

The information on the sizes of colonial *oppida* also offers an opportunity to verify an old argument which has been used in support of the credibility of the literary demographic information and maintains that there is a match between sizes of colonial *oppida* and Livy' figures. For example, Brown has argued that the proportional difference between the size of the city walls of Cosa and Alba Fucens is similar to that of the known colonial population quota of 2,500 and 6,000 (e.g. 5:12).[220] A couple of years earlier, Galsterer has argued more generally that there is a clear relationship between the length of Latin colonial city walls and the number of colonists (ratio 1-2 colonists per metre).[221] Moreover, the excavations of several maritime colonial town centres have demonstrated that they indeed were much smaller than the Latin ones, just as Livy had informed us.[222] These studies have been based on a very limited number of examples and the value of this kind of argumentation has often been doubted.[223] The vast amount of new data on colonial *oppidum* sizes makes it now possible to test this hypothesis on a much broader scale.

In contrast to what earlier scholars believed, there is absolutely no correlation between the size of colonies mentioned by Livy and the size of *oppida* (cf. Table 10).[224] On the contrary, the smallest colonies reported by Livy, Luceria and Cales (2,500 settlers), both have very large walled areas, whereas large colonies of 6,000 settlers, such as Alba Fucens and Placentia, have medium-sized *oppida*, which do not differ substantially from those of the colonies with a reported population of 4,000 settlers. These results leave two possibilities open: Livy was wrong or there was no direct relationship between the number of Latin settlers and the size of *oppida*. The latter thesis is, I believe, the stronger candidate. As I have discussed previously, several colonies were founded in already existing towns (this is particularly evident in the case of the larger categories of colonies), which leaves the question of how much space of the walled area was occupied by the colonial settlement unclear.[225] Moreover, the size of most other *oppida* is clearly determined by the characteristics of the landscape (colonial town centres are often placed on hilltops). The evidence therefore neither supports nor convincingly falsifies Livy's information. The situation in citizen colonies is rather different. The suggested differences in size between maritime citizen colonies and their later, so-called agrarian counterparts (size ratio of c. 1:7) is reflected quite accurately in the recorded town sizes. Excavations of several maritime colonies have revealed that most of these colonies were indeed very small

[220] Brown 1980, 16.
[221] Galsterer 1976, 43.
[222] See Brandt 1985 for a good overview of the lay-out of maritime colonies.
[223] According to Bispham, these attempts are baseless and do not prove that colonial foundations had standard numbers of settlers, as Livy seems to suggests (Bispham 2006, 123).
[224] The new data convincingly falsifies Galsterer's theory (Galsterer 1976, 43, discussed above) that there was a clear relationship between the length of Latin colonial city walls and reported numbers of colonists.
[225] Attempts to recognize the colonial settlements within these larger settlements have not been very convincing and are mostly based on undated orthogonal street patterns (cf. above). Clearly in colonies which were founded in former Greek cities such as Vibo Valentia (Greek Hipponion), an orthogonal lay out should be no surprise. Orthogonal street patterns in indigenous towns (Luceria) could also be pre-Roman (see, for example, the indigenous town of Pomarico Vecchio) or have been created at a later moment in time. Even if these recognized colonial settlements are accepted, the overall conclusion reached would not alter substantially: all settlements then fall in the category of medium-sized cities.

castrum-like settlements (c. 2.5 hectares) which could accommodate only a limited number of people, whereas the later colonies were fairly substantial habitation centres of almost equal size (c. 20 hectares); a proportional size ratio of c. 1: 8.

Although consistently small, the fortified centres of maritime colonies are not as uniformly sized as the recurrent number of 300 settlers reported by Livy suggests. Some of the larger colonies are up to three times as large as the smallest (cf. above). Whether these differences in Roman colonial town centres directly reflect the size of the colonial population cannot be established with any certainty, but the seemingly proportional increase (multiplication factor of 1, 2, 3) at least hints that there is some relationship between the two.

4. Dots and colonists: the problem of the missing sites

So far, the discussion has centered on the demographic landscape as it has been suggested by the literary sources, Livy in particular. Although some doubts have been expressed about the reliability of his figures, they have been shown to be compatible with other information in the sources. In this sections, a very different, independent data-set for reconstructing colonial demographics will be analysed, namely archaeology. The potential of archeology to aid demographic studies is now widely accepted and a large number of studies have recently been published which either attempt demographic reconstructions on the basis of the archaeological data-set or discuss the best methodology by which to apply such endeavours.[226] In principle, these studies estimate population sizes using two parameters: the number of site types per period (sometimes differentiating between certain and possible sites) and the multiplication of these by an estimated number of people who might have inhabited the different types of site.[227] In the conventional understanding of colonial settlement organization, the colonial landscape consisted of two site types: the colonial urban centre and isolated but regularly dispersed colonial farms. If the theory just discussed is correct in assuming that colonies were not organized as agro-towns which housed most of the agricultural population, the direct implication is the presence of densely settled rural landscapes.

In most studies dealing with Roman colonial rural settlement organization each colonist is expected to have built his own farm on his allotted holding.[228] In such a scenario the number of rural sites must more or less equal the number of colonists which lived in the territory.[229] In this section I

[226] Seminal in this regard are the Populus colloquia which took place in 1995 and which were published in five volumes (series eds. Barker and Mattingly). See especially the first volume (Bintliff and Sbonias 1999). For Roman Italy see esp. Witcher 2005; Witcher 2006; Witcher 2008; Launaro in press.

[227] For a discussion of this methodology see Sbonias 1999; Witcher 2008, 288-292. Since it is widely accepted that archaeological surveys do not recognize all ancient dwellings and, in particular, overlook the traces of the smaller rural sites, an adjustment is often made on the basis of likely recovery rates.

[228] E.g. Rathbone 1981.

[229] No doubt, this is an oversimplification of reality, and there is good reason to suspect that the actual number of colonial farms was lower than the number of reported colonists. For example, it is likely that colonists, especially fathers, sons and brothers, frequently lived together in a single farm. Moreover, since there is reason to believe that colonies suffered from depopulation as a result of high mortality and emigration (Cf. Section 2.2.4), it is unlikely that all *adscripti* successfully

shall explore what populations the archaeological record suggest if this model of colonial settlement organization is adopted.

4.1. The results from traditional, site-orientated field surveys

Since the early twentieth century, various scholars have begun to investigate colonial rural territories in a systematic manner and archaeological maps now exist for most colonial landscapes. One of the first to produce maps of this kind was Lugli, the founder of the well-known *Forma Italiae* series. In the 1920s he had already compiled inventories of the archaeological remains in the Pontine region, covering parts of the territory of the old Latin colony of Circeii as well as that of the Roman colony of Anxur.[230] These early reconnaissance projects focused almost exclusively on the monumental remains which dated especially to the late Republican and Imperial periods. For the earlier colonial periods, the merit of these topographic studies is that they succeeded in locating many colonial *oppida*, clearly recognizable by their monumental fortifications constructed of polygonal masonry.[231] In view of their focus on the monumental, these studies reveal almost nothing about the simple rural settlements of the first-generation colonists.

More systematic field surveys were launched in the 1950s, commencing with the well-known South Etruria Survey organized by the British School in Rome which covered large parts of the territory of Veii, as well as that of the old Latin colonies of Sutrium and Nepet.[232] The specific goal of this large-scale project was to record the many sites which were surfacing as the result of rapidly expanding suburban growth and deep-ploughing activities. Although research initially focused on ancient roads, it was soon realized that the more inland areas should also be investigated before modernization erased all archaeological traces. Hence, a more or less systematic field survey methodology was adopted which also allowed the recording of the simpler archaeological remains.[233]

Especially in the late 1970s and 1980s, field survey gained strongly in popularity as it fitted in well in the methodological and analytical framework in archaeology dominant at the time: processualism.[234] In this period, extensive areas in Italy were investigated, also covering substantial

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raised large enough families of their own to necessitate the building of individual farms. On the other hand, as I shall argue in chapter 5, we should expect indigenous people to have lived within the colonial territory who were not all included amongst the *adscripti* reported by Livy.

[230] Lugli 1926; Lugli 1928. After the Second World War, several other *Forma Italiae* issues were published covering other territories in the area (e.g. Brandizzi Vittucci 1968 for the territory of Cora). See Attema 1993, 56-89; Van Leusen 2002, Chapters 9 and 13 for the character of these and earlier pioneer studies in the Pontine Region. In general on this research tradition: Terrenato 1996.

[231] See Attema 1993, 56-65 with references.

[232] Kahane, et al. 1968, and Potter 1979.

[233] For a good discussion of the methodology applied see Terrenato 1996, 217-218, who observes that, by that time, the methodology applied by the Italian *Forma Italiae* researches was actually quite comparable with that employed in the South Etruria Survey. The main differences in his view are the stronger focus in the Italian tradition on the classical periods and the selection of sample areas which was based on modern IGM maps in case of the *Forma Italiae*, whereas in the South Etruria Survey a historically significant area was selected.

[234] Terrenato 1996. See also Bintliff 1991; Knapp 1992 for landscape studies which have found inspiration in the theories of the French Annales School. In terms of research objectives, two slightly different approaches can be distinguished in this period: projects in the processual and *Annales* tradition which aimed to reconstruct the long-term settlement history of a certain region, often geomorphologically defined such as river valleys (the most famous example of this tradition is Barker's

terrains in former colonial territories.[235] Generally, the goal of these surveys was to reconstruct settlement histories of large regions, which were investigated by means of selective sampling, often based on transects cutting across the main geomorphological and geological zones.[236] The sampling areas were then systematically investigated by walking all accessible fields with 5 to 25 metres' distance between the field walkers; the distance often adjusted according to visibility conditions.[237] All notable concentrations of archaeological artefacts were recorded on topographical maps of the area, and materials for chronological and functional analysis were collected and studied.

These projects mapped the remains of large numbers of small isolated Republican farmsteads, scattered over the length and breadth of the territories investigated. This image tallied strongly with the historically expected regularly settled colonial peasant landscapes. However, more detailed analysis of the chronology of these recovered sites soon revealed an important problem with the field-survey data-set: only a small number of the recovered sites contained pottery datable to the early colonial period (that is, generally the century in which the colony was founded).[238] For example, Rathbone calculated that, during the survey carried out by the Wesleyan University in the territory of the Latin colony of Cosa, only between 0.3 and 0.8 per cent of the expected number of farms of the third century had been recognized.[239] In some other surveys, the mismatch between the historically

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Biferno Valley Survey project (Barker 1995)), and survey projects influenced more by historical questions which investigated territories and land-use patterns of a specific period and historical community (e.g. Arthur 1991; Crawford, et al. 1986). Both schools employed comparable collection strategies; the most important differences are in the selection of research areas and the chronological interests.

[235] The most notable examples are: the Anglo-Italian Albegna Survey project which commenced in the late 1970s under the direction of Carandini, which covered the territories of the Latin colony of Cosa and the Roman colonies of Saturnia and Heba (Carandini, et al. 2002); the Liri Valley Survey which covered the territories of Fregellae and Interamna Lirenas (Hayes and Martini 1994) and the Northern Campania Survey which investigated parts of the territories of Sinuessa and Suessa Aurunca (Arthur 1991). See Appendix 1 for a more complete overview.

[236] On this methodology Orton 2000.

[237] E.g. in the Fregellae Survey, all accessible land where soil was visible was covered with a distance of 5 metres between participants (Crawford, et al. 1986, 42). Fields which could not be surveyed because of vegetation cover were visited the following year. In the Northern Campania Survey two different approaches were combined: intensive survey with walked transects of 5 metre spacing (this was done in the case of the map sheet of Mondragone, a north-south strip 2 kilometres wide of the map sheet of Carinola and the Massico Piedmont area of the map sheet of Sesse Aurunca). In the rest of the area, alongside roads and in less visible areas, a 'spot survey aimed at supplementing information for the settlement and land-use pattern' was used (Arthur 1991, 16). In the Liri Valley Survey, the distance between participants was larger, namely 15-25m. However, the participants walked in a slightly zig-zag fashion to reduce the chance of missing a site (Hayes and Martini 1994, 2-3). In the Albegna Valley Survey, the distance between participants was 10 to 20 metres, depending on the visibility of the field. For the more recent Forma Italiae volumes which cover the territory of Venusia for example, no clear information about the survey methodology is given; nevertheless, the relative high number and the often small size of recorded sites indicates a fairly intensive approach. It is generally assumed that a distance between participants of in-between 5 and 20 m. guarantees that most surface scatters of settlement sites are recovered.

[238] In the same period, the knowledge of fine ware ceramics and their chronology made rapid strides. Studies such as Morel's *Céramique campanienne* (1981) and Hayes' *Late Roman Pottery* (1972) made it possible to refine the chronological resolution of the survey-data.

[239] Rathbone 1983. During the survey only 2 sites dating to the late third/ early second century were recognized (Dyson 1978). Cf. Celuzza and Regoli 1982, 37 for a similar conclusion based on new survey data. Slightly higher, but still very low Early Colonial site densities in Attolini, et al. 1991, fig. 2; Cambi 1999, fig. 8.2. and Carandini, et al. 2002, fig. 40. Based on these last statistics Cambi (Cambi 1999 and Carandini, et al. 2002, 137-145) calculated that the Albegna survey project was able to recover between 20 and 33% of the probable third- and second-century colonists' dwellings in the territory of Cosa. But, on critical examination, his assessment of the quality of the survey record has proved to be too optimistic (Pelgrom 2008, 348 n. 46).

expected colonial landscapes and the results of the survey was also noted, although not expressed in absolute recovery rates.[240]

My analysis of a large number of surveys conducted in Roman colonial territories demonstrates that these disappointing results do not stand alone, but that low recovery rates are symptomatic for most areas that have been investigated using a traditional, site-orientated survey methodology (see Appendix 1 for the survey projects and their results and Appendix 3 for a detailed description of the compatibility between the archaeological record and the text-based expectancy using a basic site=colonist equation). The recorded settlement densities for early colonial sites are usually far below 1 site per sq. km, and even if all Republican sites are taken into account settlement densities rarely exceed densities of 3 sites per sq. km. This is clearly much lower than what ought to be expected based on text-based demographic reconstructions (compare the Graphs 11-15 below with Graphs 3 and 7 in Section 3.1.).

How can this mismatch be explained? Generally, the explanation of this so-called 'problem of the missing sites' is that it is the result of the incapability of survey archaeology to recover the traces of colonial dwellings. It has been assumed that the dwellings of these autarchic soldier farmers were very modest and therefore difficult to recognize in the field,[241] a standpoint supported by methodological studies which have demonstrated that small structures are easily overlooked by standard field surveys.[242]

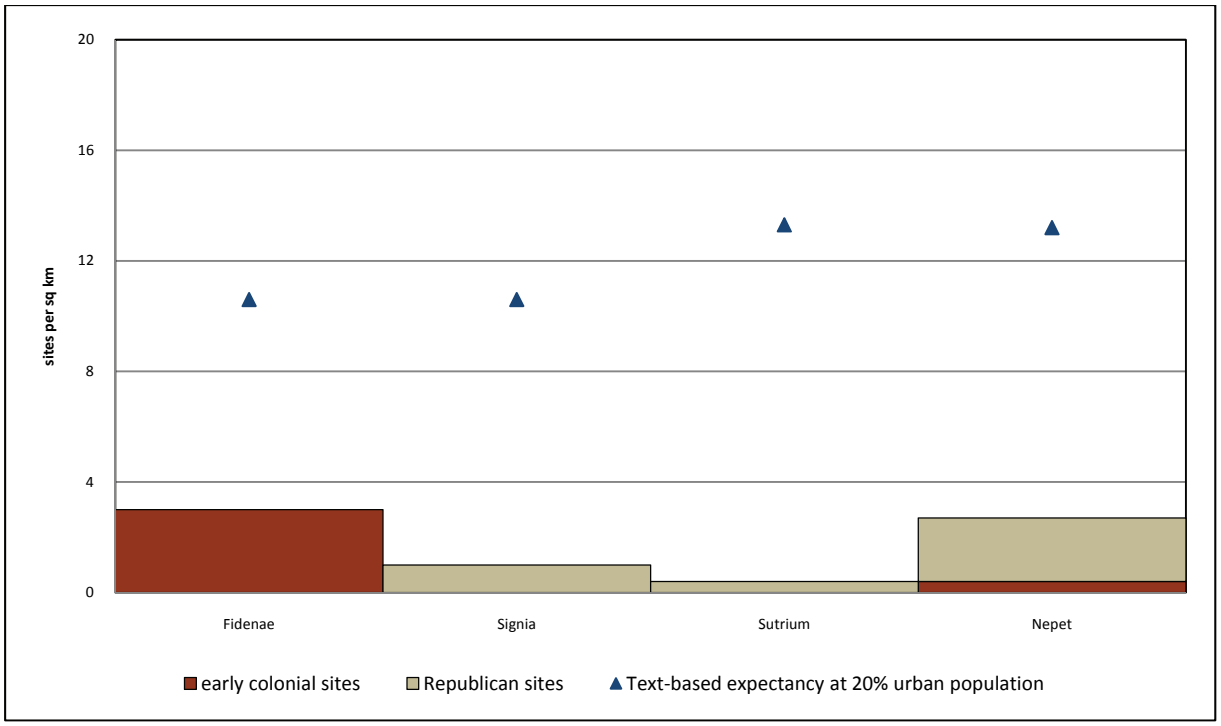
This line of argument has recently been defended by Rathbone.[243] Taking his evidence from the literary sources (mainly on the sizes of allotted holdings), he argues that colonial peasants (especially those in citizen colonies) were subsistence farmers whose assets only just qualified them for membership of the fifth class. He imagines, therefore, that these relatively poor people lived in very simple houses, comparable to the oval mud-brick huts known to have existed in Central Italy in the archaic period.[244] He believes the fact that such ephemeral settlements are not recorded by archaeological field surveys can be demonstrated by evidence from excavations. The few sites recognized during surveys which have been properly excavated (all second century or later) have turned out to be solidly built edifices, the majority of which measured more than 200 sq. m. (although the smallest was 50 sq. m.) and had tiled roofs.[245] Rathbone claims that these farms could not have been the dwellings of the simple subsistence farmers and probably belonged to people in the higher

[240] Hayes and Martini 1994, 36; Arthur 1991, 100.
[241] E.g. Rathbone 1981, 17; Rathbone 2008 and Scheidel 1994, 11. A slightly different explanation is that colonists lived in very simple houses because they used all their energy to build the requisite public structures (Celuzza and Regoli 1985, 51; Muzzioli 2001, 9), or that, as a result of natural attrition and the depredations of the Gallic invasions and Punic Wars, early settlements were short-lived and therefore difficult to recognize (Dyson 1978, 259).
[242] Plog et al. 1978; Cherry 1983. For a good recent discussion of the relationship between survey intensity, survey area, and site retrieval rates in Italian archaeology see Van Leusen 2002, Ch.4, with further references.
[243] Rathbone 2008.
[244] Rathbone 2008, 310.
[245] Rathbone 2008, 310-321 for references.

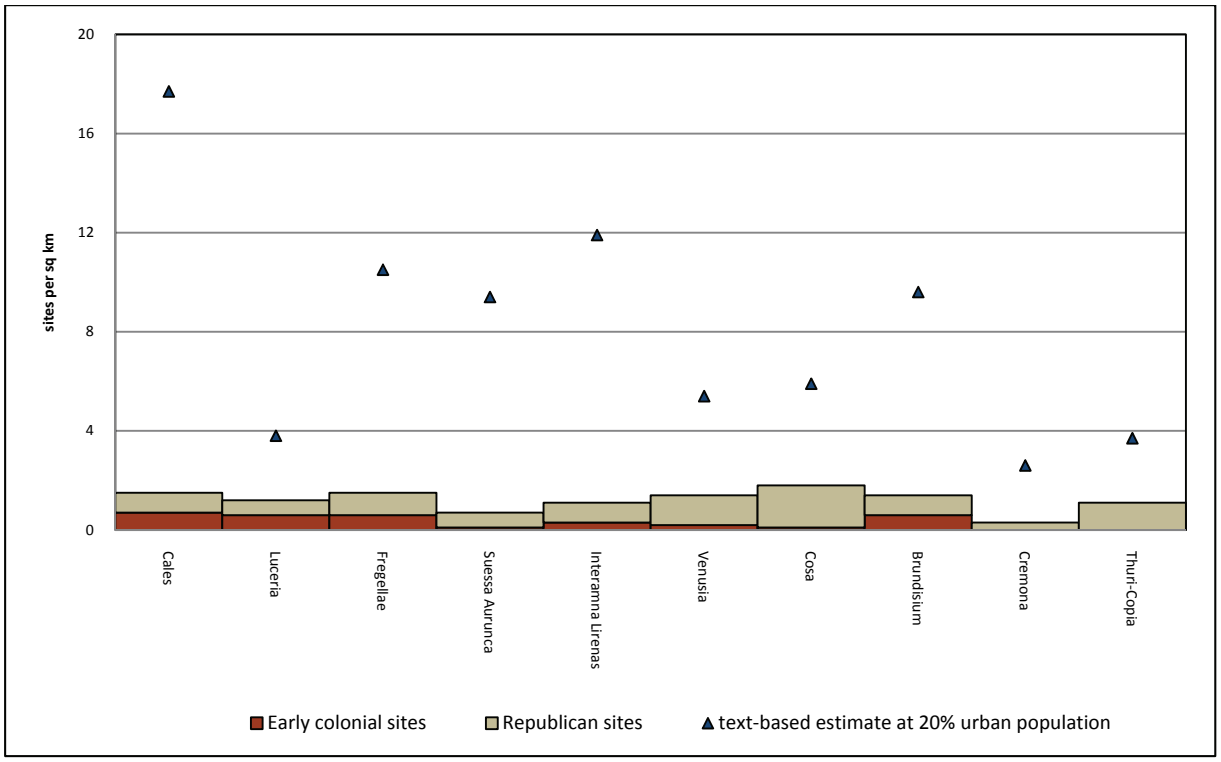
echelons of Roman society; the simpler structures have not been recognized during large-scale surveys and consequentially have not been excavated.[246]

No doubt, traditional archaeological surveys often miss the traces of ephemeral structures. Since the late-1970s, field archaeologists have acknowledged this methodological problem and have begun to develop new, more intensive survey techniques which should allow a more accurate reconstruction of ancient settlement history.[247] The results of these recent approaches will be discussed below. Before reviewing these results, it is worth underlining that, if Rathbone's theory is correct, this implies a radical change from earlier conceptions of colonial landscapes. If indeed colonial farmsteads were so primitive as he suggests, they would have looked nothing like the impressive, monumental countryside depicted in Fig. 2, but they rather looked like Archaic landscapes which differed little from those of previous periods in terms of monumental appearance and are either similar to or even more primitive than most reconstructions of the settlement organization of the conquered indigenous communities.[248] If the argument is indeed the instrument to explain the missing site problem, it is necessary to assume that this situation did not change radically during the entire Republican period since, as has been discussed above, even the inclusion of all recognized Republican sites still amounts to very low compatibility rates.

[246] However, Postmedieval archaeologists have shown that supposed lower classes have beter material access than is often expected and consequentially that they are recognizable in field surveys, especially those adopting more intensive sampling methods (Orser 2004).
[247] The literature on this topic is immense. See for some recent influential publications Bintliff and Sbonias 1999; Bintliff, et al. 2007.
[248] For example, excavated examples from fourth/third century farmsteads in the mountainous Samnite region cover more than 400 sq. metres, are solidly built and were covered by a tiled roof (Di Niro 1993).



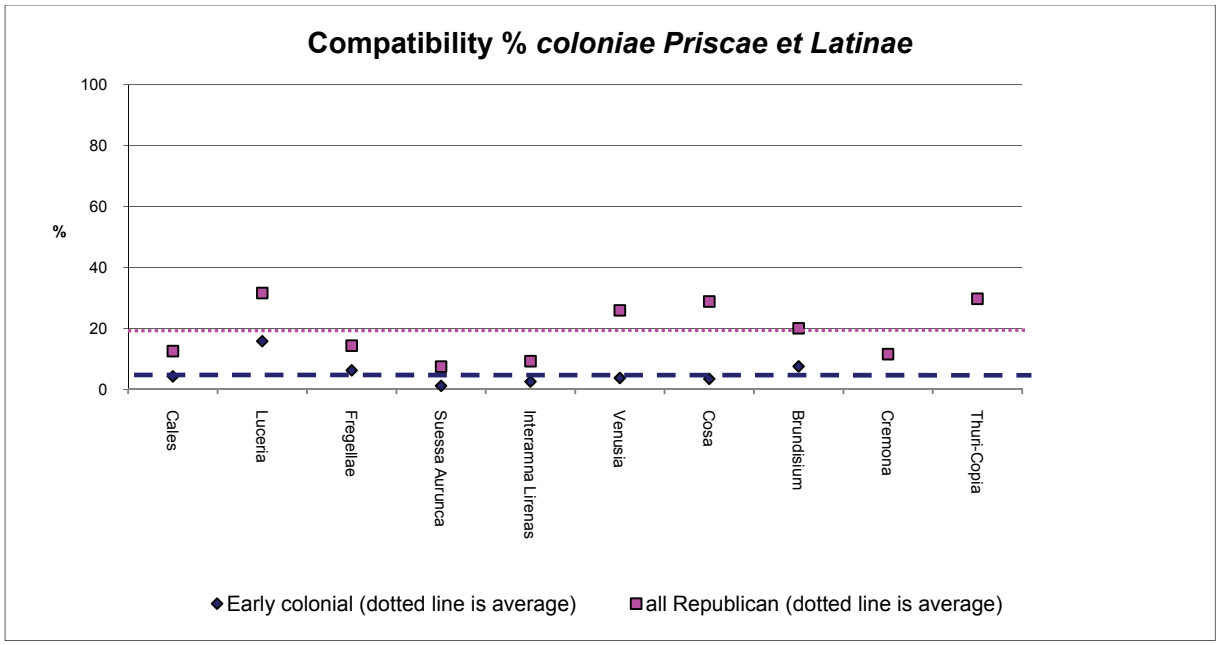
Graph 11: Site densities achieved in surveys of colonies founded before the Latin War. [249]



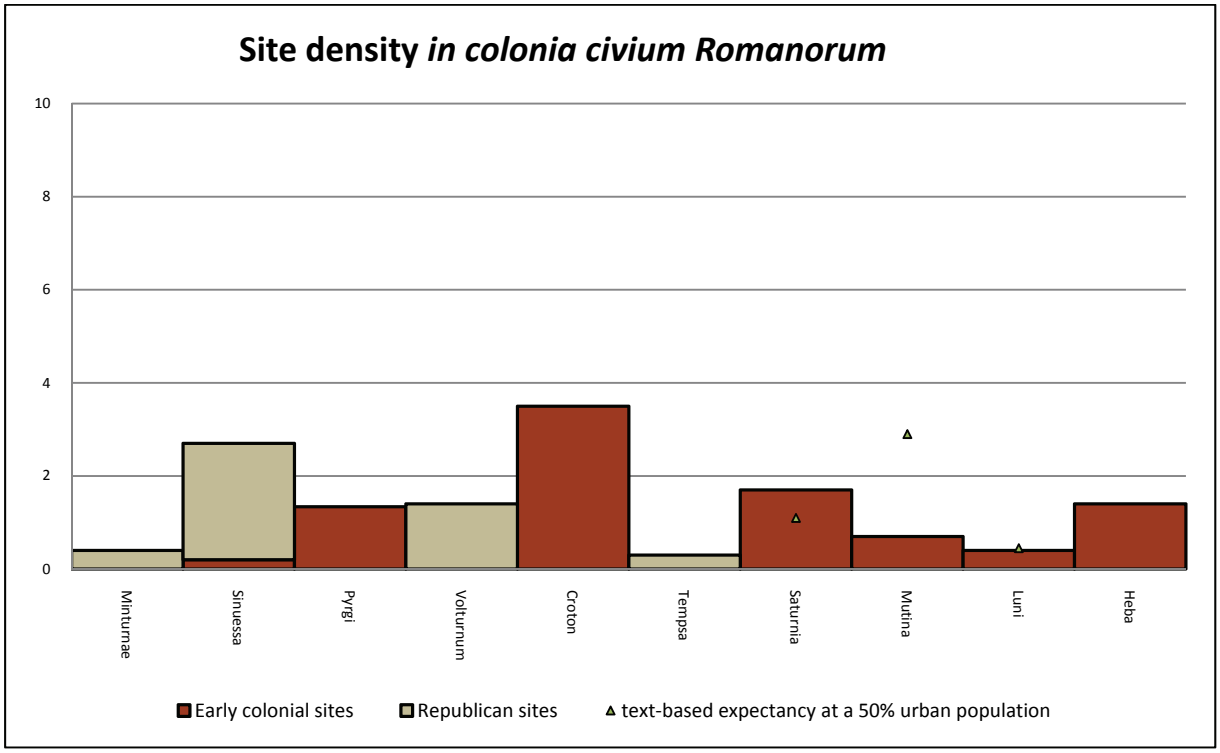
Graph 12: Site densities achieved in surveys of *Coloniae Latinae*.[250]

[249] For densities see Appendix 1. For text-based expectancy see Graph 3. The expectancy is based on an urbanization rate of 20%. In the case of some of the earlier colonies, this might be on the low side, but in the case of later ones, it is probably too high (see main text).

[250] For densities see Appendix 1. For text-based expectancy see Graph 3 (I have used the average of the various estimates). The expectancy is based on a 20% urban-based population. The dotted line indicates the average expected density of rural



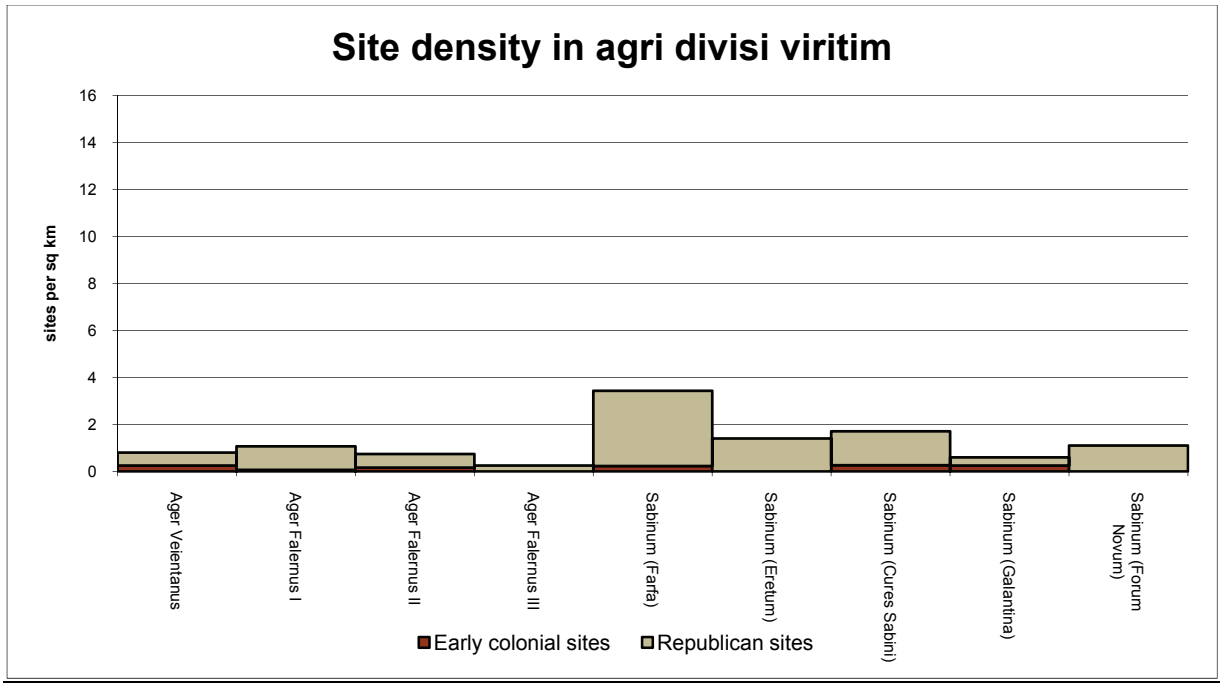
Graph 13: Compatibility % between text-based demographic estimates and the results from survey archaeology.



Graph 14: Site densities achieved in surveys of *Coloniae Civium Romanorum*.[251]

colonial farms. In those cases in which more survey projects investigated different parts of a colonial territory, I have displayed the average achieved densities (excluding the results of topographic studies).

[251] For densities see Appendix 1. For text-based expectancy see Graph 7 (I have used the average of the various estimates). The expectancy is based on a 50% urban-based population. In the case of more survey projects investigating different parts of a colonial territory, I have displayed here the average achieved densities (excluding the results of topographic studies).



Graph 15: Site densities achieved in surveys in areas of viritane settlement. [252]

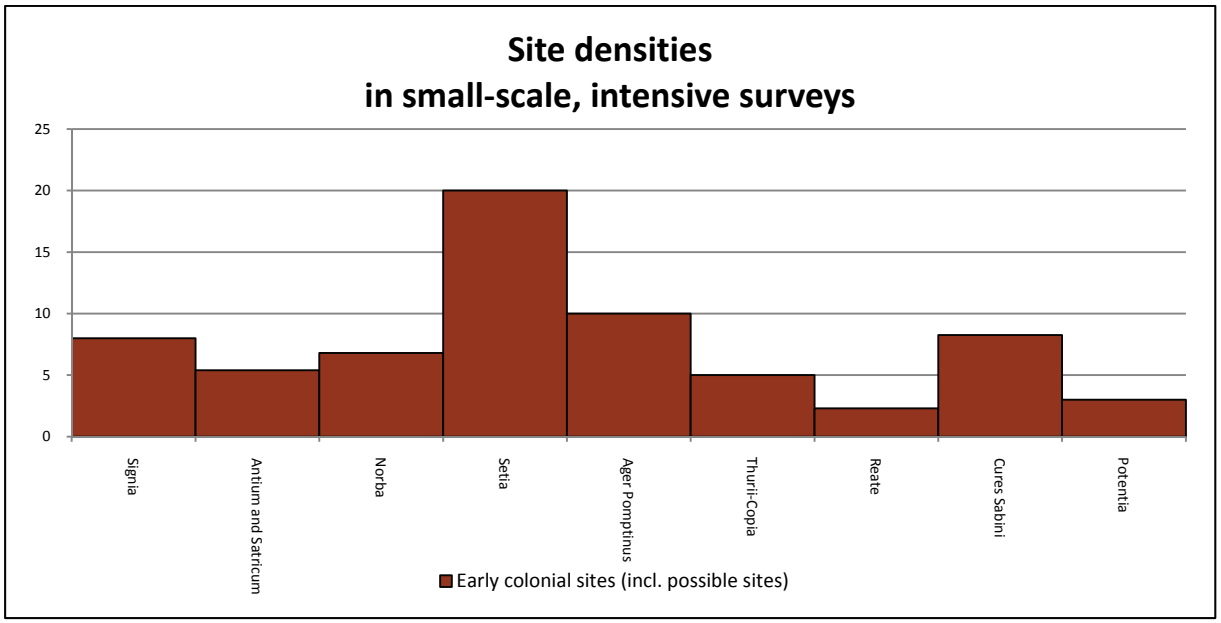
4.2. Methodological bias: the results from intensive off-site surveys

It did not take very long for survey archaeologists to realize that large-scale survey projects miss a considerable percentage of the smaller settlements and this recognition gave birth to a fruitful debate about how these difficulties can be overcome, which has continued ever since. One of the responses to the problem has been the development of a much more intensive field-sampling strategy.[253] The most important break with the earlier traditions is the recording of visibility conditions and the use of an off-site sampling strategy which records all archaeological material encountered, using defined spatial units as reference. This time-consuming procedure has the merit of making it possible to define concentrations less subjectively. The artefact density maps which can be compiled on the basis of this recording strategy (preferably with a high resolution and corrected on visibility conditions) allow for the detection of 'sites' which would otherwise have been missed in the field.

These projects have convincingly demonstrated that there is a positive correlation between the intensity of field surveys and the number of recovered sites.[254] Possibly the best example in Italy is the study of Van Leusen, who compared site retrieval rate for several types of surveys carried out in the Pontine plain. His assessment shows that the small-scale, off-site surveys conducted by Groningen University resulted in site densities of up to ten times as dense as the early topographic *Forma Italiae*

[252] For densities see Appendix 1.
[253] The majority of the early experiments with intensive field-survey strategies have been conducted in projects in Greece, e.g. Cherry 1983; Bintliff and Snodgrass 1985.
[254] This was first demonstrated by Plog and his colleagues (Plog, et al. 1978) in several surveys conducted in the American south-west. Not much later, Cherry 1983 showed that there is a strong negative correlation between the size of the investigated areas in Greece and site retrieval rates.

Surveys.[255] In fact, almost all colonial landscapes which have been investigated by means of an intensive off-site survey strategy have mapped much higher site densities than traditional large-scale surveys have (compare Graph 16 with Graphs 12, 14 and 15).



Graph 16: Site densities achieved in small-scale intensive surveys in colonial territories.[256]

At first sight, these statistics seem to corroborate Rathbone's hypothesis that the low number of recognized sites is the result of the incapability of traditional large-scale survey projects to record the traces of ephemeral settlements. However, closer inspection of these results reveals some important biases, especially in the sample areas chosen for investigation by intensive surveys, which nuance the differences in site retrieval rates achieved by the different survey strategies considerably.

Most intensive off-site surveys have concentrated on fertile areas at present under cultivation. The upshot is that the sizes of the sample areas are more or less equal to the amount of terrain which was actually covered by field walkers. In the traditional large-scale surveys, this has not generally been the case. Sample areas often include considerable tracts of non-arable terrain unsuitable to systematic field walking and which are usually explored very superficially, if at all. Therefore the territorial parameter used for establishing site densities in large-scale surveys differs fundamentally from that employed for small-scale, intensive surveys (e.g. whole territory versus surveyed arable land only).[257]

[255] Van Leusen 2002, Chapter 4 esp. fig. 4.1. See also Attema and De Haas forthcoming for a study on site retrieval rates in the territory of Antium.
[256] For densities see Appendix 2.
[257] Since the expected colonial population densities per sq. km. are averages which result from middling probable low-density settlement areas and high settlements areas, surveys covering fertile arable areas only should be confronted with a higher expectancy of settlement.

Since it is often unclear what percentage of the sample area of traditional surveys is arable land which was actually field-walked, it is difficult to correct the survey results for this bias. One possible indication is provided by the Rieti Surveys, one of the few intensive off-site surveys which also included more mountainous marginal zones. The overall settlement densities mapped in this project are substantially lower than those achieved by the surveys carried out in the Pontine plain. This discrepancy is largely the outcome of the inclusion of marginal landscapes in the sample area. About half of the research area was located in higher, mountainous zones; here only a small percentage of the landscape could actually be field-walked and almost no traces of Republican settlement were recognized. In the lower lying areas, about half of the terrains were suitable to be surveyed. Here an overall density of six sites per sq. km was recorded. However, if the recognized sites are divided by the terrain which was actually field-walked, the resultant figure is twice as high.[258] This density is comparable to that recorded in the other off-site surveys.

Possibly the best way to study the actual difference in site retrieval rates obtained by intensive and conventional surveys is to compare the site numbers which have been recorded in areas actually covered by both types of survey. This exercise is, for example, possible for the territories of Cures Sabini and Norba. The small-scale intensive surveys conducted in these territories recorded overall site densities that are a factor of 8 to 10 denser than those mapped during the previous large-scale *Forma Italiae* reconnaissance projects. However, the actual difference in retrieved site densities for the area which was actually covered by both survey projects is only a factor of 2 to 3 higher.[259] In the territories of Satricum, Antium and northern part of the territory of Cures Sabini, resurveys resulted in less than a doubling of recovered sites.[260]

Interestingly, resurveys by Groningen University in the territories of Thurii-Copia and Norba, which used the more conventional 'site survey' method, resulted in site densities which approach those achieved by the intensive off-site surveys.[261] This demonstrates that there are considerable differences in quality of the survey records of the conventional 'site surveys'. At present, it is impossible to rule out the possibility that a doubling or even trebling of sites recovered by means of intensive resurvey can only be achieved in territories which have been investigated in the topographical tradition.

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[258] Coccia/ Mattingly 1992, 245.

[259] For the Corese survey see di Giuseppe et al 2002, 109. About three times as many sites were recognized than the *Forma Italiae* survey of the 1970s had (Muzzioli 1980). During the Groningen resurvey of a small part of the territory Norba, in the so-called Ninfa survey (Leusen et al, 2003/2004, 304 fig 3.) 14 new sites were recognized in an area of less than a sq km,where Vittuci in the context of the *Forma Italiae* survey had mapped only 5 sites. (in van Leusen 2001, table 3a the difference is even smaller, here he gives 6 Republican sites discovered by Vittucci against 10 by the Ninfa survey.

[260] During the Farfa Survey which also covered part of the Muzzioli Cures Sabini Survey 'a moderately higher number of sites' was recognized (Di Giuseppe et al 2002, 102). The so-called Astura Survey (Attema et al. 2007/2008, 431 and site catalogue)) covered 1.55 sq. km. of terrain in the vicinity of the colony of Satricum. Here 4 new sites were recognized, where previous work had mapped 5 sites. See also Attema and De Haas forthcoming for a comparison between the results of earlier traditional surveys (Liboni and Piccarreta) and those from recent intensive surveys. Generally, a doubling of site numbers has been achieved by the intensive surveys. The survey in Thurii-Copia recognized twice the number of sites as the previous survey of Quilici had done (Attema et al. 2001/2002, 413).

[261] For Thurii-Copia see Van Leusen and Attema 2001-2002; for Norba: King 1995; Van Leusen, et al. 2003-2004.

Not all intensive off-site surveys conducted in the fertile areas of colonial landscapes have mapped high settlement densities. For example, the 'Potenza Valley Survey Project' recorded considerably lower site densities than those achieved by the Groningen University surveys. An overall density of little more than three Republican sites per sq. km. was mapped. If account is taken of the fact that this survey concentrated on specific areas favourable to settlement (alongside the coastal road and in the foothills), this density is fairly comparable with those retrieved during more traditional site surveys in Central Italy. A great variety of reasons might have contributed to this deviant pattern, ranging from differences in visibility, geomorphology and site definition criteria. Nevertheless, there is reason to believe that the disparity in retrieved site numbers reflects actual differences in settlement organization.

Those surveys which recorded high rural settlement densities are all located in two rather atypical Italian landscapes; both characterized by early urbanization processes and densely settled rural territories in the pre-Roman times.[262] This circumstance is demonstrated by the results from the Groningen surveys which clearly show that the dense networks of isolated settlement in both the Pontine region as well as that of the Greek *polis* of Thurii had begun well before the Roman colonization of these areas. Moreover, traditional site surveys conducted in these regions have also usually mapped much higher site densities than other comparable surveys in Italy.[263] The clearest examples are the surveys carried out by Carter in the territories of the neighbouring Greek *poleis* of Metapontum and Croton.[264] The site densities mapped in these landscapes are comparable to those retrieved by the intensive off-site surveys of Groningen University in the territory of Thurii. Similarly, traditional site surveys conducted in the old Latin city-states have also recorded higher site densities than in most other regions. Possibly the best example of this is the Fidenae survey, which mapped a density of more than three early colonial sites per sq. km.[265]

Finally, I want to draw attention to the differences in the way sites are defined by different survey projects. As discussed above, the important benefit of intensive small-scale survey projects is that the fainter traces of ancient human activity in the landscape can be recognized. However, the more detail is acquired, the more complex the interpretation of these traces becomes. Since other forms of human activity (e.g. fertilizing, rubbish disposal) and building (e.g. storage facilities, periodical habitations and the like) can also create ceramic scatters, not all ceramic concentrations can be interpreted as settlement residues. The logical consequence is that, while traditional surveys run the specific risk of missing the more marginal traces, their dots on the map are more likely to represent habitations (as they are often composed of more visible traces such as large quantities of stones and tiles and fine wares), while the archaeological maps produced from intensive survey represent more

[262] Torelli 1995, 1-17.
[263] Another good example of this factor can be found in the Biferno Valley area. Overall site densities in this river valley were almost 3 sites per sq. km. (Barker 1995, 51). However, in the area around the town of Larino where two different large-scale surveys have been conducted (Barker 1995; De Felice 1994), site densities are almost twice as high.
[264] A synthesis of the results of the survey of Metapontum in Carter 2006 (esp. Ch. 5); for Croton a synthesis in Carter 1990.
[265] Quilici and Quilici Gigli 1986 (see Appendices 1 and 3).

differentiated landscapes which need to be analysed with more caution when used to calculate population densities. That such a distorting factor also applies to the Pontino Surveys is made clear in the publication of the survey around Norba which states that the vast majority of all Republican sites are classified as 'Class 1' sites, meaning the smallest type of site. These sites 'should be interpreted as modest family farm structures built of perishable materials with a (partially) tiled roof, but other site types such as agricultural outbuildings, sheds or simple tombs might also be present in this class.'[266]

On the whole, the conclusion can be drawn that, although intensive off-site surveys indubitably record higher site densities than traditional surveys and have demonstrated the existence of densely settled Roman territories in Italy, problems arise when an attempt is made to extrapolate these results to larger regions; let alone to Roman colonial landscapes in general. The main problems with the current data-sets for the areas investigated in this manner are the rather small scale and above all the fact that the selected landscapes might not be representative for colonial territories in general.[267] The strong biases of these surveys towards fertile zones and areas close to important roads, sanctuaries or cities undermine their overall representativeness.

4.3. Conceptual bias: the model of dispersed settlement

In Roman archaeology and history for some decades now, there has been a particular interest in the vicissitudes of the small rural farm, generally interpreted as the home of the Roman peasant. The motive behind this, of course, relates to the larger debates on Roman society and economy, most notably the rise of the slave-based villa economy and the consequent disappearance of the small proprietor (see Chapter 1). Hence, results from field survey have been mostly interpreted (and still are) in a bi-polar interpretative framework: either villa or small farm.[268] Whereas the former is regarded as indicative of the economic processes of the concentration of property and a slave workforce, the latter is seen as evidence of the traditional peasant economy which was based on the family household. The village usually only appears in the narratives of the pre-Roman and Late Antique/ Early Medieval periods, which are characterized as periods of economic backwardness or decline.[269] This scheme of Italian settlement evolution also complies with a more general paradigm in settlement archaeology and historical geography which associates dispersed settlement with dense populations, private smallholdings and a related intensive form of agriculture, whereas in contrast nucleation is believed to be linked to political instability, economic contraction, subsistence agriculture and elite control of the land.[270]

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[266] Van Leusen, et al. 2003-2004, 331.
[267] On this also Fentress 2009,129-131 and more generally on the problems concerning the representativeness of small-scale intensive surveys Fentress 1999; Terrenato 2004.
[268] E.g. Potter 1979, 121 fig. 35; Ikeguchi 2006, 139-142.
[269] A good example is again Potter's diachronic study of South Etruria. His fig. 46, which shows the Medieval sites, is predominately dotted with villages, while none is displayed in the maps depicting the Roman phases. On the view which connects villages with pre-Roman forms of settlement see Chapter 4.
[270] This view ultimately goes back to the historical geographer Meitzen (Meitzen 1895) who noted that a relationship existed between settlement systems and systems of land ownership. He believed that ethnicity (Germanic or Celtic origin) explained

Although several studies have questioned the classical paradigm of the disappearance of the traditional peasant economy in the Late Republic, its flourishing existence in the pre-Hannibalic period is generally accepted.[271] This view is based on evidence in the literary texts on the socio-economic emancipation of the lower classes which was achieved amongst other means by the distribution of land as private property in the fourth and third centuries and, of course, on the texts lamenting the disappearance of these peasants in the late Republican period. Although the generally accepted hypothesis of the conjunction of fragmentation and (re-)contraction of landed property might be correct, it is also possible to ask if this was necessarily accompanied by a process of dispersal and (re-)nucleation of settlement.[272] Fully scattered modes of settlement have been rare in Italian history and, when they have occurred, were usually connected with very intensive agricultural practices, population pressure and political stability.[273] It is doubtful that colonial territories complied with these conditions. Probably there was more than enough land captured to cultivate, which was, however, located in a hostile environment, since it was surrounded by potential dangerous indigenous peoples. In a scenario of the absolute control of these territories and people by Rome, a scattered form of settlement would have been feasible; however, if it is assumed that the colonists themselves had to defend these places, such scattered landscapes lose some of their credibility.

This raises the question on what evidence this image of scattered colonial settlement is based. Perhaps the most important support for this view is found in the rigid land division systems which have been recognized in colonial landscapes and which seem to be supported by the literary information about colonial land distribution programmes. These will be discussed in Chapter 3. However, the archaeological field- survey data is also likely to have contributed to such an understanding. Archaeological maps of Republican Roman landscapes are generally densely dotted with symbols representing small sites, giving an impression of flourishing peasant landscapes (cf. Fig. 6). As I shall argue in Chapter 4, these maps are misleading since they often have a very coarse chronological resolution and, more importantly, visualize their data on a large scale, which naturally results in densely dotted landscapes. If the data is analysed in more narrow chronological horizons and on a smaller scale, the emptiness of these landscapes soon becomes apparent.

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the differences in settlement systems in east and west Germany. On the relationship between rural productivity and settlement systems (especially the distance to cultivated land) see Chisholm 1979, esp. chapter 6. For a discussion within archaeology Athanassopoulos 2010 with further references.

[271] On see Chapter 1. The seminal paper is of Frederiksen 1970-1971. Very recent studies, however, have started to question this scenario and argue that peasants were tied to the elites and that tenancy and similar forms socio-economic organization may have dominated Republican Italy (eg. De Ligt 2000; Terrenato 2007).

[272] But see Chapter 3 for a more nuanced picture.

[273] For settlement organization in the Medieval period see Wickham 2005, Chapter 8. According to conventional understanding, the predominantly nucleated settlement landscape of modern Central Italy developed during the Early Middle Ages and is known as the *incastellamento* process (Hubert 2002 with references). On the study of rural settlement organizations in general Bunce 1982 (see especially his chapter 4 on settlement evolution in colonial contexts). A good example of a failed attempt to seduce people into living dispersed on their holdings on a regular basis are the many abandoned rural houses in the province of Matera (South Italy), built in the first half of the previous century in an attempt to repopulate the countryside (on this King 1973). People soon abandoned these houses and returned to the villages.

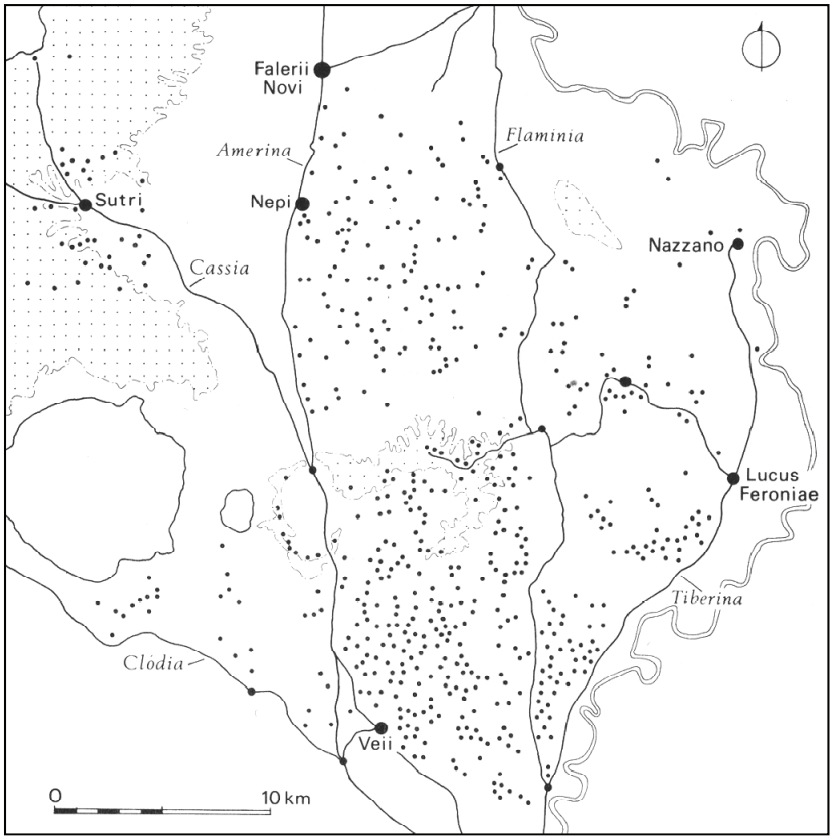


Fig. 6: South Etruria Survey: the Republican period. Black dots indicate the location of small farms (From Potter 1979, 97, Fig. 27).

Of course, this discrepancy does not undermine the fact that field surveys of Republican landscapes have predominantly recognized isolated small sites, although in low densities, and only a few nucleated settlements. These findings could have been biased by the interpretative framework described above, in which the complex archaeological reality is reduced to a simple villa-farm functional differentiation. As a matter of fact, the few field survey publications which have provided information about site-sizes suggest that, behind these uniform dots on the map, hides a more differentiated settlement landscape. This issue will be discussed in detail in Chapter 4. For the present, the question which needs to be answered most urgently is if the site-size factor offers a solution to the mismatch between the text-based demographic estimates and the results of archaeology.

In Table 12 I have described what densities of large settlements must be achieved in order to approach the historical demographic expectancy. These densities are comparable to the total site densities achieved in most surveys for the early colonial period (Graphs 12, 14 and 15). Consequently, in order for this factor to explain the missing site problem fully, it has to be assumed that the majority of the recognized sites represent hamlets and villages.

Table 12: Density of villages per sq. km. necessary to achieve text-based population estimates	
Number of colonists per site	Density of sites necessary to achieve a population density of 8 colonists per sq. km.
50	0.16
30	0.26
15	0.53
10	0.8
5	1.6
Combination: 1 large (50 fam.); 3 middle sized (15 fam.); 5 small (5 fam.).	0.6

But only in a few cases can this hypothesis be defended.[274] The stumbling-block is that in most cases either information about site-sizes is absent or the inclusion of the site-size parameter only marginally affects compatibility rates. This is, for example, demonstrated by a calculation made by Cambi for the population of the *Ager Cosanus*. He includes site-sizes in his calculation, which results in a population considerably larger than one resulting from an estimation strategy which uses site numbers only (from 59 families to 72 households).[275] Nevertheless, this is still only a fraction of the c. 2,000 rural families which could be expected to be found in this area on the basis of the literary record.

Moreover, using site-sizes for establishing population sizes is methodologically problematic. First, particularly large sites often have long occupational histories. Therefore, the sizes of such scatters are not necessarily indicative of the early colonial period. Second, long-term and intensive ploughing activity can turn small dense scatters into large diffuse ones. Detailed information about the relationship between artefact density (of particular periods) and scatter size is therefore necessary for substantiating functional interpretations of the sites in particular periods.

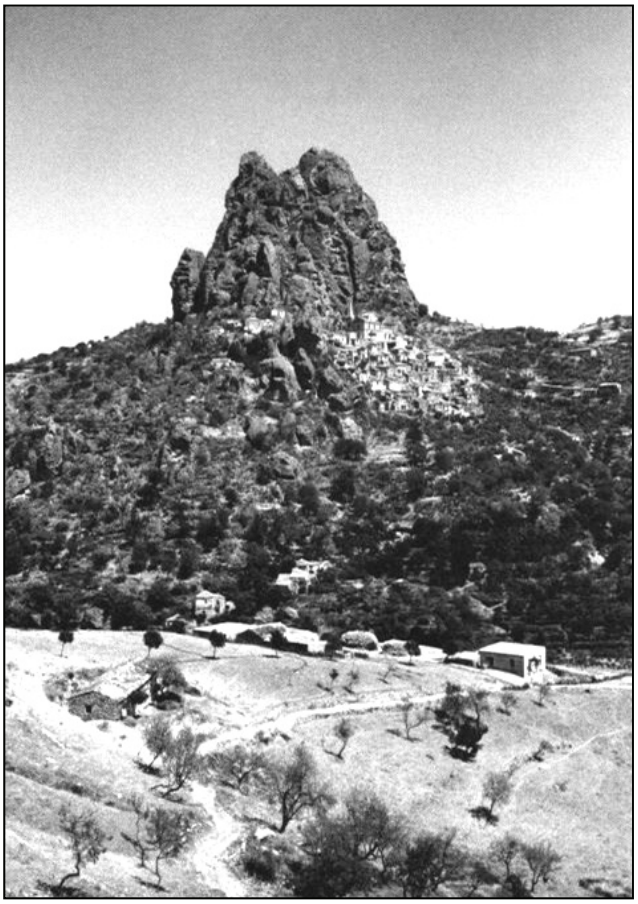
Because such information is not usually provided by survey publications, at the current state of research it is impossible to assess the impact that site-sizes have on our demographic reconstructions, and to establish whether they would offer a satisfactory explanation for the missing sites problem. In any case, I hope to have shown that the traditional conceptual framework which sees colonial peasant landscapes consisting of evenly scattered small settlements has strongly influenced the interpretation and representation of the archaeological data of this period. Indeed, in the few cases in which it is possible to see behind the dots on the map, much more varied settlement forms seem to emerge.

[274] Possible examples are Luceria en Fidenae (see Appendix 1 and 3).
[275] Cambi 1999, 116; Carandini, et al. 2002 All sites smaller than 900m ² are considered single colonist dwelling (House 1); a site between the 900 and 4,000 sq. m. without evidence of complex architecture such as columns and mosaics is interpreted as a double family residence (House2). Scatters of 4,000 m² or more are considered to reflect the residues of villages with respectively 10 (if smaller than 10,000m2) and 20 colonists (if larger).

A related, potential biasing factor regards field survey strategies and their relation to specific settlement systems. Field-survey techniques (traditional or intensive off-site strategies alike) are particularly useful for investigating modern agricultural areas which are (or have been) under the plough.[276] This means that they predominantly map settlement in fertile, arable zones. In those cases in which farmers lived on their land, as is predicted for colonial landscapes and is also characteristic of villas, this should give good results. However, if many people in Central Italy lived in villages which are often located in non-agricultural zones (mostly hilltops), as they do now, standard field surveys are likely to miss a substantial number of them (see Fig. 7 and 8).

[276] Although in modern field surveys fields with low visibility are also often investigated and the find densities are corrected for visibility conditions, this is often limited to agricultural fields with low visibility because of vegetation cover. Non-agricultural areas, such as woodlands, are seldom investigated as field-survey methods (both intensive and extensive) are of little used there. For a recent attempt to use different prospection techniques to examine these landscapes see Van Leusen and Feiken 2007.

Fig.7: Examples of Apennine mountain villages (photos F. Monaco in: *Obiettivo sull'anima*, IT 13 (2002 Milano).



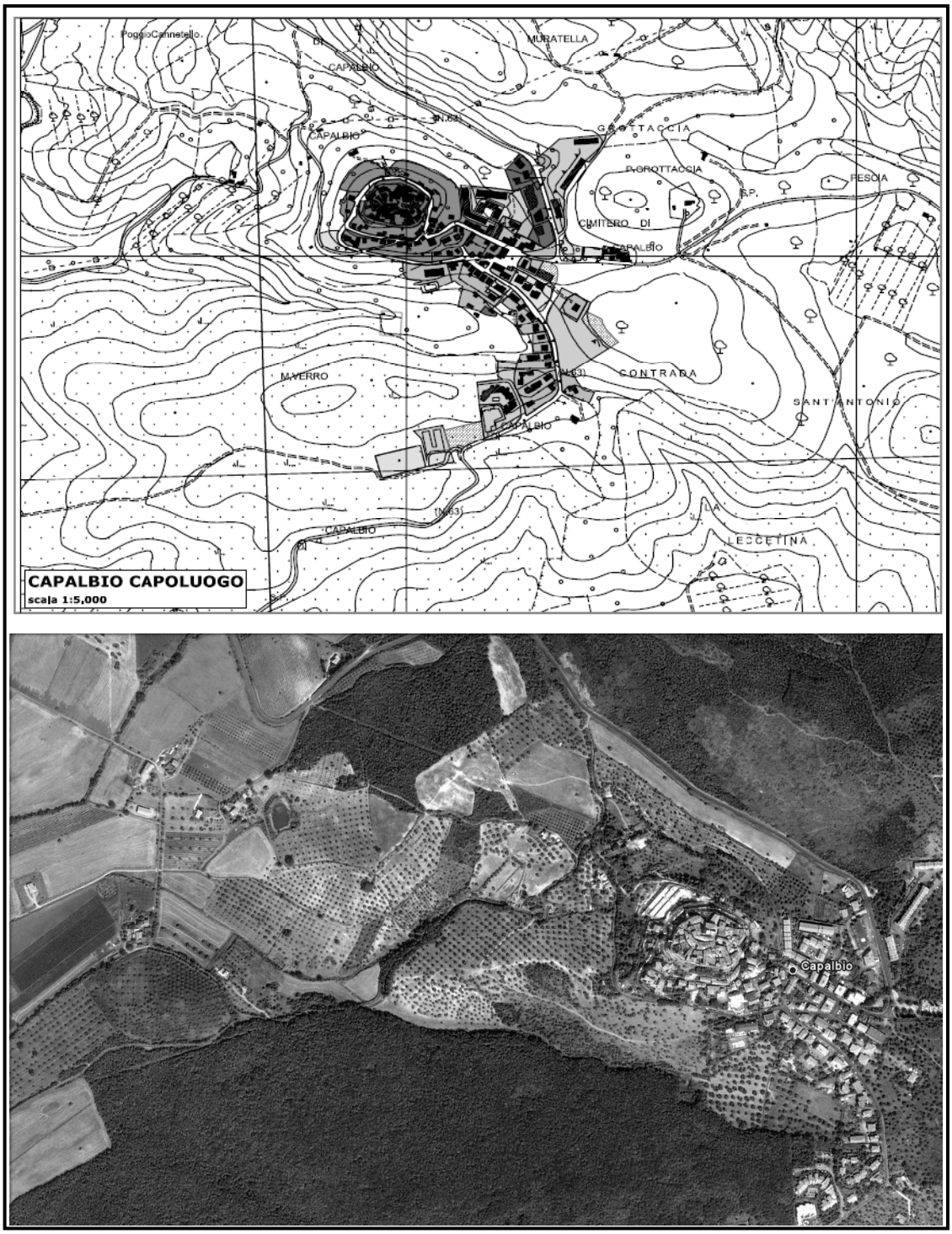


Fig. 8: Example of a typical Central- Italian hill-top village (Capalbio, Tuscany). The village is located c. 12 kilometres to the north-east of the ruins of the Latin colony of Cosa. Above (Piano strutturale Capablio, from http://www.comune.capalbio.gr.it). In brown: the size of the village before the 18th century; in red: the extension of the village in the eighteenth century; green, yellow and purple: moderns extensions. Below (Google earth image): the lands surrounding the village are used for oleoculture and woodland. The arable fields (best suitable for field surveys are located c. 1 kilometre to the west of the village). The ancient centre of the village measures c. 5.5. hectares; with modern extensions c. 15 hectares. Nowadays, 622 people live in Capalbio (average of c. 3 persons per house).

4.4. Drawing up the balance

The confrontation between the text-based demographic estimates and the results of large-scale field surveys in colonial territories has clearly demonstrated that there is a huge discrepancy between these two data-sets which cannot be resolved by assuming that most colonial farmers had an urban base. Trying to find an answer to the question of why the archaeological landscapes are so empty, I have investigated two possible solutions.

The first possible explanation assumes that large-scale surveys have missed most colonial dwellings because they were ephemeral structures whose remains are not easily recognized in traditional archaeological surveys. In other words, in this scenario the conventional view of colonial settlement organization as consisting predominantly of regularly scattered farmsteads can be maintained by blaming archaeological method. The other solution is that we have been looking for the wrong model of colonial settlement organisation. As has been made clear, a combination of conceptual biases and related practical matters (such as survey strategies) has led archaeologists to overemphasize the presence of scattered mono-nuclear farmsteads in their data-set and to marginalize nucleated forms of settlements..

In Chapter 4 I shall argue that, on closer inspection, the archaeological record for the early colonial period indeed suggests that a clustered pattern of settlement prevailed in most early colonial landscapes. Combined with a deconstruction of the presumed existence of rigid land division systems in the pre-Punic War period offered in the following chapter, these results strongly suggest that the conceptual framework which sees colonial landscapes as evenly settled landscapes of mono-nuclear farmsteads must be wrong. Once this expectation is set aside, it becomes possible to recognize more varied settlement landscapes in published reports. More importantly, it is an invitation to start looking for nucleated settlements in future research projects. At this stage it is impossible to know if such an approach will bridge the gap between the archaeological evidence and the text-based demographic estimates, but it is in any case likely that it will bring both data-sets closer to each other.