Regional Field Survey and the Demography of Roman Italy

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"Everyone knows that the models which inform most of the demography of the past decade are illusory, images of population which have never in fact existed, but are good to think with" (Golden 2000: 32).

Introduction

Regional field survey has identified tens of thousands of settlement sites around the Mediterranean;[2] the potential significance of this evidence for demographic reconstruction has long been discussed.[3] This article considers some of the key debates concerning the demography of Roman Italy from the perspective of archaeological field survey. First, it addresses the question of whether or not the results of survey archaeology reveal the supposed decline of the peasantry during the second century BC; specifically, it examines the republican settlement evidence of the South Etruria survey. Second, it considers a demographic model of the early imperial *suburbium*[4] and evaluates its working assumptions; in particular, it considers the significance of this suburban population for the wider debate about the size of the early imperial population of Italy as a whole – the 'high' vs. 'low counts'. Finally, two models are developed to explore the implications of these high and low population figures for our assessment of the significance of the archaeological evidence; they imply two very different reconstructions of the socio-economic organization of Roman Italy. However, both models suggest that regionality is a critical consideration.

Archaeological survey and historical texts

The South Etruria survey was one of the earliest systematic archaeological field surveys in the Mediterranean; instigated by John Ward-Perkins in the mid 1950s, it spanned twenty-five years.[5] The potential relevance of these survey results for the republican demography of Italy was rapidly identified; already by the late 1960s attention was directed specifically to the contribution the survey could make to discussion of the demographic changes implicit in the 'Gracchan crisis'. Here the archaeology offered a (seemingly) independent check on the traditional text-based narrative largely built upon the works of Appian, Polybius, and Cato the Elder. Essentially, this narrative focused on the spread of capitalistic agricultural estates using slave labour, combined with the continuous wars of the republic, leading to a decline of the peasant class.[6] Field survey offered the settlement evidence (farms, villas, etc.) with which to assess this model.

One of the earliest discussions was Frederiksen's (1971-2) *Dialoghi di Archeologia* article, in which he applied the results of the South Etruria survey to the Gracchan problem. In direct contrast to the prevailing text-based model, Frederiksen argued that the archaeological evidence presented clear support for an increase in settlement numbers (and implicitly, population) around

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[2] Barker and Lloyd (1991).
[3] Bintliff and Sbonias (1999).
[4] Witcher (2005).
[5] Potter (1979).
[6] Most eloquently outlined by Hopkins (1978).

Veii, Capena, and Sutri during the second century BC;[7] this was echoed by Nagle, who noted that farms continued to outnumber villas.[8]

However, some scholars were (and some remain) dubious about the potential contribution of survey data to such historical debates. In the same year that Frederiksen's article was published – 1971 – Brunt reformulated and forcefully restated the traditional 'Appian' model; he too made reference to the South Etruria survey results, but expressed broader concerns over survey evidence and its possible contribution.[9]

Despite Frederiksen's explicit recognition of the problems of survey data, he was in fact rather too optimistic about the ability to date the black gloss (*vernice nera*) pottery. Indeed, one of the key South Etruria survey reports, the Ager Veientanus survey,[10] which was still unpublished at the time he presented his paper, is rather more cautious. Whereas Frederiksen dated most of this material to the second century BC,[11] Ward-Perkins and his colleagues refrained from committing to any date more precise than the last three centuries BC.[12] Indeed, Potter's synthesis of the South Etruria survey material explicitly rejected any attempt to subdivide the republican period material into chronological subphases;[13] he argued that the Tiber valley demonstrated considerable conservatism in comparison with the coast, rendering existing chronologies inappropriate.[14]

Arguably, the contribution of the South Etruria survey – and regional survey more generally – to the demographic problems of the second century BC was poorly served during this period: some scholars were over-optimistic in their approach, others were too pessimistic. Interestingly, many (but not all) of the former were classicists and many of the latter were archaeologists.

Clearly, one of the key barriers to progress was the dating of the black gloss pottery; it was a preliminary restudy of a sample of this material during the early 1980s which reopened the possibility of identifying second century BC settlement and population decline.[15] The results suggested that 80% of the South Etruria survey black gloss pottery dated to the fourth and third centuries BC, and just 20% to the second and first centuries. However, it was not until the late 1990s that the first full study of all the South Etruria survey material (not just the black gloss) was undertaken, involving *c*.90,000 sherds of pottery.[16]

The results of this recent work support Liverani's pilot study, with most black gloss dating to the fourth and third centuries BC.[17] Using this material, the Tiber valley project has created a new chronological framework and redated each settlement site (Table 1).[18] The results suggest a significant dip in settlement numbers during the period *c*.250-150 BC (Late Republican 1). It is, of course, important to note that even this new chronological framework is still rather coarse when compared with the resolution offered by the historical sources and it does not offer convenient pre- and post-Gracchan phases with which to gauge the context and impact of the Gracchan reforms. Nonetheless, it does present the possibility of identifying trends *within* the Republican period; unsurprisingly, these results have already attracted some attention in relation to the demography of late republican Italy.

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[7] Frederiksen (1971-2, 344-6).

[8] Nagle (1979, 424-8, 433); see also Nagle (1976, 487). Skydsgaard (1969, 28-34) covers the same ground, but is more cautious about the chronology of the emergent archaeological evidence and its demographic implications; see also Garnsey (1979, 3-4).

[9] E.g. whether sites were in contemporary occupation, recovery rates (see below), the issue of agro-towns, etc. He explicitly discusses the issue of black gloss chronology and the problem of identifying Gracchan colonists. Nonetheless, he notes that that the peasantry clearly survived during the late republican period, Brunt (1971, 352-3).

[10] Kahane et al. (1968).

[11] Frederiksen (1971-2, 345).

[12] Kahane et al. (1968, 11).

[13] Potter (1979, 95-6, 109-10).

[14] See also Taylor's comments in Kahane et al. (1968, 56-7).

[15] Liverani (1984).

[16] Tiber valley project: project outline, Patterson & Millett (1998); preliminary results, Patterson et al. (2004).

[17] For details of the black gloss pottery see Di Giuseppe (2005).

[18] See Patterson et al. (2004) for fuller discussion, especially table 1. In the following text specific periods as defined by the Tiber valley project are capitalized (hence 'Late Republican 1').

Table 1. Number of Middle Tiber valley sites by period
(based on Patterson et al. 2004, figure 3)

Chronological period	Dates	Number of sites
Mid Republican	350-250 BC	513
Late Republican 1	250-150 BC	199
Late Republican 2	150-30/1 BC	561
Early Imperial	30 BC-AD 100	1486

A preliminary report on the findings of this restudy of the South Etruria survey material identified a series of 'crises', including an apparent mid-third to mid-second century BC decline.[19] A number of problems with the interpretation of these data were identified, and overall the authors were cautious about the ability to identify specific historical events and processes using such archaeological material. Similarly, in a more recent paper Di Giuseppe argues that the changing quantities of black gloss should be considered primarily in terms of production and consumption, and only secondarily in terms of historical processes of settlement and demography; Roth makes a similar point about black gloss in Italy in general.[20] Nonetheless, with the growing intensity of the 'high/low' population debate, speculation about the relevance of these findings to the traditional narrative is inevitable.[21]

Given the perceived centrality of the South Etruria survey data to the Gracchan problem, these new results offer a valuable opportunity to revisit the issue; more generally, they provide an excellent case study with which to consider the broader issue of the integration of textual and archaeological data.

The starting point must be an explicit recognition that the archaeological and textual records are created through fundamentally different processes; therefore they have their own particular strengths and weaknesses, and these differences should be respected.[22] Indeed, common sense should alert us to the problems of using archaeological data to identify or 'materialize'[23] a *c*.10% decline in the number of male Roman citizens over a period of a few decades given the chronological insensitivity of the ceramics, the problematic relationship between pottery, site definition and site population, the geographical dispersal of this population, and the fact that it formed just one (legally defined) group within a larger population. And all that before the motives of both historical individuals and writers have been considered. Here, however, I put aside the question of whether or not it is sensible or desirable to expect textual and archaeological records to correlate, and focus on the limited quantity of republican material culture (and specifically of mid-third to mid-second century BC black gloss) with which the traditional narrative can be explored.

In the understandable attempt to respond to historical questions, archaeologists continually refine chronological frameworks into ever shorter periods. However, as these periods become shorter, more and more material culture is rendered chronologically 'generic' (i.e. a sherd of 250-1 BC becomes 'generic' and is excluded from analysis of the sub-periods 250-150 BC and 150-1 BC). Hence of 6985 sherds of black gloss only *c*.1900 sherds (*c*.27%) can be dated to a specific subperiod.[24] In other words, any chronological trends identifiable *within* the republican period are necessarily based on only a fraction of the total assemblage. However, as the vast majority of these closely-dated sherds are rims and bases, and the vast majority of the generically-dated sherds are

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[19] Patterson et al. (2004).
[20] Di Giuseppe (2005, 49); Roth 2007, 77-94, with specific reference to second century BC demography at 190-6; Roth 2006 for discussion of black gloss from Capena in south-eastern Etruria, particularly at 138; for the same point, but on a broader scale, see Witcher (2006a, 49-52).
[21] Di Giuseppe (2005, 52).
[22] On the Gracchan issue specifically see Rathbone (1993).
[23] Porter (2003).
[24] For comprehensive details of the black gloss pottery see Di Giuseppe (2005).

body fragments, it is a reasonable assumption that the chronological distribution of the body sherds should broadly correlate with the datable rims and bases. It is therefore unlikely that all generically-dated black gloss relates to a single sub-phase – the Late Republican 1, for example. In other words, the inability to date the majority of black gloss sherds should not have significantly distorted the ratios of material culture over time.

The chronological distribution of the diagnostic black gloss sherds is heavily skewed towards the Mid Republican period (Table 2). Just 4% of sherds are datable specifically to the Late Republican 1 period. Such rarity is a problem for any sampling strategy.[25] The key question is: was there really no Late Republican 1 black gloss on a particular site, or is this material so rare that it is impossible to be certain that it was reliably recognized during survey? In terms of probability, it would be necessary to collect at least 25 sherds of black gloss to be confident that, if Late Republican 1 black gloss *were* present, a single representative sherd would be recognized.

Table 2: Chronological distribution of black gloss pottery (based on Di Giuseppe 2005: appendix 2). NB the low Late Republican 2 total is supplemented with significant quantities of other datable artefacts, e.g. coarsewares, plain wares, and early terra sigillata italica *forms; such additional dating material is very limited for the Late Republican 1 period.*

Republican subperiod	*Number of closely-datable black gloss sherds*	*% of total black gloss (6985 sherds)*	*% of closely-datable black gloss (1900 sherds)*
Mid Republican	1251	18%	66%
Late Republican 1	261	4%	14%
Late Republican 2	388	6%	20%

The South Etruria survey was rather unsystematic by modern standards.[26] A representative 'grab' sample of sherds was collected from each site in order to establish occupation within a few broad chronological periods – etruscan, republican, early imperial, etc. The primary concern was the achievement of a broad date for each site's occupation, not the collection of a large and representative sample of material culture. As a result, sample sizes from individual sites are small; the average number of black gloss sherds collected at each site where it occurs is just six (median = 3; mode = 1). In other words, the sample sizes are far below the level necessary to be confident that any Late Republican 1 material present on a site was included in the sample. (In contrast, the average of six sherds corresponds to the minimum number necessary to recognize with confidence the presence of any Mid Republican material.)

The scarcity of Late Republican 1 material – combined with the South Etruria survey's sampling method – makes it impossible to state emphatically that there was a reduction in the number of sites (and indirectly, population) during this period. A number of other observations support these conclusions. For example, over one-third of the sites abandoned in the Late Republican 1 period were reoccupied in the subsequent Late Republican 2 period. This could be taken as evidence for the abandonment and reoccupation of a site due to changing population levels, but it is also exactly the pattern to be expected when one period has notably less (diagnostic) material culture than prior and subsequent periods. In similar circumstances other surveys have assumed continuous occupation.[27]

Further, there is no clear spatial patterning in the distribution of continuing, abandoned, and reoccupied sites; for example, the abandonment of marginal areas or land around villas might be expected as a result of depopulation or estate agglomeration. Rather, continuing and abandoned

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[25] For an ecological parallel see McArdle (1990).
[26] Potter (1979, 10-14); Witcher & Craven (forthcoming).
[27] E.g. the Rieti survey: Coccia & Mattingly (1995, 114).

sites are thoroughly interspersed with continuing sites across the whole area. This is exactly the pattern to be expected when mapping a random stochastic process based on low figures.

Hence the apparent decline in mid-third to mid-second century BC settlement numbers is highly problematic. The rarity of material – and the particular methods used to sample it – mean that the definition of brief subperiods will inevitably lead to erratic variation in the quantities of pots and therefore sites. Even simple adjustments to the start and end dates of the republican subperiods can dramatically change the quantities of material included or excluded, and thus transform 'settlement histories' and demographic trends. None of this is to argue that the chronological framework as defined is wrong – indeed it reveals interesting new patterns. But the decision to use this tight periodization comes with implications which should not be ignored. In this case, clearly there were significant changes in the quantities and forms of black gloss in circulation (e.g. a shift in the organization of production and consumption).[28] However, there are insufficient data to argue confidently for a decline in the number of sites (and population) during the Late Republican 1 period. It is important to stress that this critique does not mean that there was *no* settlement or population decline, simply that it is impossible to use the current data to support or falsify this scenario; the data could equally suggest material impoverishment (fewer pots) or population nucleation (fewer but larger sites). The improvement of dating resolution in pursuit of historical insights therefore comes with certain costs. There is a risk of creating patterns on the basis of ever less evidence and then interpreting these in terms of stock historical debates (e.g. demographic change) when they may well relate to a number of other possibilities, such as changing consumption.[29]

In summary, the South Etruria data cannot contribute directly to the specific issue of second-century BC settlement (and population) decline. More generally, caution should be exercised when applying archaeological data to any text-based narrative; improving chronological resolution is not the panacea it often seems. However, archaeology can feed into the historical issue under consideration. Even if it is impossible to identify short-term population shifts, the much broader, long-term population increase postulated by the 'high counters' may well be more amenable to archaeological investigation. In other words, though it is impossible to falsify specific text-based models such as the second century BC population decline using survey data, it should be possible to evaluate the validity of the alternative 'high count' model. The next section outlines some of the key methods used and problems raised by demographic models based on survey data.

Archaeological survey and population figures

Those who argue for the importance of field survey point to its usefulness for demographic reconstruction.[30] Often, however, this reconstruction has been implicit or rather simplistic. For example, in *The Changing Landscape of South Etruria*, Potter entitled his chapter on the first millennium BC, 'The Population Explosion'; however, he goes no further than associating increasing site numbers with increasing population.[31] In contrast, over the past decade surveyors have become more confident about survey data and their ability to address demographic issues in particular.[32] Indeed, it has even been argued that it is *necessary* to go beyond the mapping of sites ('dots on maps') and to (re)populate these landscapes with people in order to appreciate their significance.[33]

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[28] Di Giuseppe (2005, 52-3); Roth (2007, 65-102).
[29] Witcher (2006a).
[30] See papers in Bintliff & Sbonias (1999).
[31] Potter (1979, c. 4, esp. 59, 72, 89). Most of the interim South Etruria survey reports, published in the Papers of the British School at Rome between 1955 and 1977, do not even mention the issue of population, and none discusses it in any detail.
[32] Osborne (2004).
[33] Sbonias (1999).

The principal method of survey-based population reconstruction quantifies the number of site types per period and multiplies these figures with standard site populations, for example, five individuals (or one household) per 'farm'. The populations of nucleated settlements (villages and cities) are commonly reconstructed by multiplying their urban area (in hectares) by population densities derived from comparative studies (commonly 100–250 persons/ha). Elements of uncertainty or debate can be accommodated within these reconstructions by using minimum and maximum site population ranges (e.g. 5–10 individuals per farm) and/or the inclusion of probable/possible sites (e.g. 10 certain farms and 5 possible farms). Examples of this basic approach include surveys from Laconia,[34] Jerba and the Albegna valley,[35] and the *suburbium* of Rome.[36]

More elaborate versions of this methodology have refined the chronological resolution of site occupation down to individual centuries. For example, Perkins' reconstruction of the republican population of the Albegna valley considers the date range of individual sherds from each site; if half or more of a sherd's date range falls within a specific century, then the site is considered occupied.[37] This chronological refinement allows Perkins to break down an undifferentiated republican period into individual centuries and to make closer observations about the relationship between the archaeological evidence and key historical events (e.g. the foundation of the colony of Cosa). However, this approach suffers from the same problem as the republican material from the South Etruria survey; that is, in order to achieve ever finer chronological resolution it is necessary to work with ever less of the material and to make ever more assumptions of it. Arguably, this method appears to work because the shorter periods and smaller quantities of material culture combine to create erratic changes in settlement numbers which seem to fit well with the serial agricultural and political crises which litter republican history.

A slightly different approach to demographic modelling builds on ecological carrying capacity, using Geographical Information Systems. Goodchild uses textual and comparative evidence for estate size, sowing rates, yield ratios, etc. in order to model agricultural production as a proxy for population in the middle Tiber valley.[38] This detailed modelling involves large margins of error, but usefully encompasses urban as well as rural population by considering agricultural surpluses.

All of these approaches move the relationship between textual and archaeological data onto a new level. Instead of indirect comparisons of census figures with generalized settlement trends, a much more immediate comparison of absolute population numbers has emerged – *x* million against *y* million. To what extent do these textual and archaeological population figures complement or contradict? And what are the assumptions which underpin such reconstructions?

In order to answer these questions, it seems appropriate to consider my own reconstruction of the early imperial population of the *suburbium*.[39] The principal aim of this model was to consider the social, political, and economic interaction of metropolis and *suburbium*. This was motivated by three considerations: 1. Existing population estimates for the *suburbium* appeared far too low – Beloch suggested the equivalent of 10 persons/km^2;[40] most recently Blanton has argued for 31 persons/km^2;[41] 2. Quilici's (rather neglected) observation on the high density of settlement, and therefore population, in the *suburbium*;[42] if corroborated, this would have wide-ranging implications for urban-rural relations, which archaeologists and historians had not yet fully explored; 3. If it really were possible to reconstruct past populations using field survey data, there could be no better-suited combination of period and place than the early imperial *suburbium*: a

[34] Cavanagh et al. (1996).
[35] Fentress (forthcoming).
[36] Witcher (2005).
[37] Perkins (1999); see also Cambi (1999).
[38] Goodchild (2006; 2007).
[39] For fuller discussion of the model see Witcher (2005). See also Scheidel in this volume.
[40] Beloch (1886, 402-3).
[41] Blanton (2004).
[42] Quilici (1974a, 424-5).

wealth of survey projects, highly-dispersed settlement, abundant and varied material culture with many imports, and a short chronological span. If it were impossible to reconstruct the population of the early imperial *suburbium*, then it would cast doubt on the whole enterprise of using survey data for demographic reconstruction in general.

Full details of the methodology are contained in my earlier article, but a summary is provided here. The basic model proposed standard site densities/km^2, based on the results of various field surveys in the area up to 50 km from Rome and in the area from 50–100 km from the city. From these it was possible to calculate the number of sites in the two zones. Population ranges for each site type (farm, villa, etc.) were then reviewed and 'informed estimates' proposed. It was then possible to calculate the minimum, maximum, and informed estimate figures for the immediate and wider *suburbium*. The figures ranged from *c*.195,000 to *c*.650,000, with an informed estimate of *c*.325,000 (the equivalent of *c*.60 persons/km^2) for the immediate *suburbium*, and an additional informed estimate of *c*.385,000 for the wider *suburbium* (the equivalent of *c*.42 persons/km^2).

It is important to stress that such models are heuristic devices; in keeping with the opening quotation from Golden,[43] there was no suggestion that the early imperial population was either exactly or constantly 325,000. Rather, this was a working figure, in the right order of magnitude, with which to think through issues such as the relationship between urban and rural populations. Indeed, at double the previous highest estimate of the suburban population, and six times Beloch's figure, the model suggested that there were significant implications for existing assumptions about metropolis-hinterland relations.

However, the success of the methodology for the reconstruction of the early imperial population does not presuppose that it can be applied universally. Reconstructing the population of successive periods raises considerable issues concerning the relative visibility of settlements over time. As the above discussion of the South Etruria survey black gloss pottery emphasizes, some periods, such as the republican, present particular problems of visibility because of their heavy reliance on a single diagnostic artefact class and/or long chronological duration. In other words, although it may be possible to apply the same basic methodology to reconstruct the size of the republican suburban population, this may be a relative underestimate and therefore difficult to compare directly with the early imperial figure.

In order to deal adequately with the many issues raised during the reconstruction of the population of a single period, the original article deliberately restricted itself to discussion of the early imperial period alone and did not address the issues raised by diachronic reconstruction. In reality, such problems of visibility may mean that it is possible to reconstruct ancient population only for a few specific periods and places;[44] the coincidence of large amounts of diverse and diagnostic material culture, dispersed settlement, and short chronological duration make the early imperial *suburbium* one of these rare cases. However, because the early imperial population must fit into a longer demographic history, it provides a valuable baseline from which to approach the demography of other periods and regions.

In identifying the large scale of the suburban population and considering its implications for interpretations of Roman society, my earlier article arguably achieved its stated aims. However, in passing it was noted that, were these population densities extrapolated across the whole of Italy (with due allowance for mountains, etc.), they would appear to support the 'low count' for the wider Italian population. This presented something of a paradox; even though the reconstructed population of the *suburbium* had been at least doubled, across Italy as a whole this would still only be sufficient to match the 'low count'. This situation is surely explained by the implausibly low level of previous estimates of suburban population density; this provides a useful demonstration of why it can be useful to "think with models".

The model itself started with no ideological attachment to either the 'high' or 'low count'; the aim was simply to assess whether the scale and significance of the *suburban* population had

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[43] Golden (2000, 32).
[44] See Sbonias (1999, 9).

been underestimated. (Whether or not I started with implicit assumptions which conditioned my choice of parameters only others can judge.) Having identified the paradox of a higher suburban population *and* a lower Italian total, the second half of this article considers whether or not it is possible to identify even higher population densities in the suburban and other landscapes and what these might mean for the 'high' and 'low counts'.

Models and assumptions

All models inevitably involve assumptions. Which of the assumptions made by the *suburbium* model might be revisited in order to find more people in the suburban landscape? Two main issues will be discussed: number of persons per site type, and recovery rates.

a. Number of persons per site type

For each site type the model summarized minimum, maximum, and 'informed' population estimates; for farm sites, these figures were five, fifteen, and eight respectively. The decision to assign eight individuals to each farm, instead of the more conventional five,[45] was based on comparative evidence for extended rural peasant families. This has attracted criticism; Fentress has argued that eight is too high and that five may be a better reflection of rural family size *after* conscription, high mortality, etc.[46] Further, Rosenstein has demonstrated that such small nuclear families could be remarkably robust.[47] However, for current purposes (i.e. assessing whether it is possible to increase the population total further), it is sufficient to note that an informed estimate of eight persons per farm is already too high for many scholars and skewed towards producing a higher population total.

However, it is important to consider two related issues: site definition and population. Osborne has noted enormous variation in the cut-off point between farms (populated with a fixed number of individuals or families, or multiples thereof)[48] and larger sites, such as villages, where population figures are derived by multiplying site size by standard population densities. For example, for one survey, a 1 ha scatter may be a farm with a population of five individuals; for another survey, it would be a hamlet with a population of 100. This is clearly a critical issue, especially if population estimates are to be compared between surveys and regions. However, the survey evidence from the *suburbium* makes it difficult to tackle this issue directly. In the vast majority of cases scatter sizes were not recorded; indeed, the bulk of the evidence comprises 'legacy data' collected during the 1960s–80s, which inevitably fall short of modern survey standards.[49] Further, most ancient towns lie beneath medieval and modern successors, and town size is only reliably known in a few cases. Hence in the model standard site populations were used for all site types, including villages and towns. (It is worth noting, however, that where urban site size is known, the figures calculated on the basis of site size and population density are similar, e.g. the informed large town population figure was 5,000; Falerii Novi extends across 30 ha; at 100–250 persons/ha, this totals 3,000 to 7,500 persons.)

More broadly, this raises the issue of site type definition. How is a farm to be distinguished from a villa? Scholars have made great efforts to establish the appropriate archaeological criteria. However, Rathbone has questioned the near universal survey dichotomy which makes a rigid distinction between 'farm' and 'villa'; he argues that archaeologists have oversimplified reality and in the process created two bogus historical categories.[50] In order to address issues such as the decline of the free peasantry and the rise of the slave villa estates, scholars have sought pseudo-historical categories such as farm and villa in the archaeological record. In reality the evidence –

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[45] See Osborne (2004)
[46] Fentress (forthcoming). See also Wilson (2008).
[47] Rosenstein (2004).
[48] Usually five individuals (or one family/household) per farm: Osborne (2004).
[49] For the problems and possibilities of such data see Witcher (2008).
[50] E.g. Rathbone (1993); see also Rathbone in this volume.

especially in the *suburbium* – suggests a more complex settlement spectrum which can be resolved into two categories only with massive generalization.[51] However, it is important to appreciate that it is almost impossible to strip away these interpretative categories from existing survey data. These two categories are not simply overlaid on survey results; rather they permeate right down to practice in the field, conditioning what is recorded and how. Hence in the current model the dichotomy between farm and villa as made by individual surveys is maintained on the basis that the distinction is 'reasonably robust'.[52] This does not mean that the dichotomy is real, but simply that this *archaeological* classification is one of many valid methods of dividing up this site spectrum; it is 'robust' in the sense that most surveys are clear about the *relative* distinction of farms and villas in their local context. Archaeologists have to work with the data available; attempts to erase such categories from these 'legacy data' are limited by the information recorded by earlier surveyors (e.g. size, artefact densities). Further, the prospect of new spatially-extensive, high-intensity surveys matching the scale and quality of evidence recovered by the South Etruria survey is, unfortunately, remote.

Returning to the population of individual site types, the informed villa site population was 25 individuals. This is rather lower than estimates in other regions (e.g. Albegna valley),[53] on the basis that many of these sites are relatively small, both in terms of scatter size and the size of their notional estates. For many of these sites 25 individuals may be too many; for others (for example, the Villa of the Volusii) it may be too few; it is, however, presented as an average figure which encompasses a broad range of villa sites.

Villages contribute only a tiny proportion of the total population, and the informed figure (100) could be doubled to the maximum population with minimal significance. It is possible that undiscovered villages lie beneath medieval and modern successors (indeed several inscriptions recovered from towns such as Riano and Rignano (CIL XI 3858-4080) may well indicate the presence of *vici*); however, the original model made generous allowance for such sites, assuming some 50 villages. In reality there is limited direct evidence for this number of sites. Certainly some very extensive scatters are known in the area south of Rome;[54] to the north of the city there appear to be fewer. It is very possible that acceptance of the farm/villa dichotomy led the South Etruria surveyors to identify a cluster of farms rather than a single village (however, the *demographic* significance of this error is less significant). Again it is sufficient for current purposes to note that even the generous figure of 50 villages contributes less than 2% of the overall population total in the current model; increasing village populations from 100 to 200 and doubling the total number of sites (from 50 to 100) still contributes only 20,000 persons. Villages are a particularly understudied settlement type in Roman Italy, but in the *suburbium* their demographic significance was limited.

Moving on to urban centres, the figures used in the model are lower than the Italian average estimated by Brunt (*c*.7,800);[55] the reason is that, despite the density of towns in this area, individual centres were relatively small in comparison with the larger cities of Umbria and especially of northern Italy. Again, however, even if the maximum urban populations are considered, this adds only *c*.20% to the overall total. Leading on from this, if urban population is increased too far, the urban-rural ratio starts to exceed the widely accepted figure of *c*.10–20%. This, of course, is another assumption which should be explored. But higher urbanization rates would require a fundamental reconceptualization of Italian urbanization and economy along the lines of the more heavily-nucleated Greek model. (It should be noted that model already suggests a high urban:rural ratio of *c*.30% including Ostia, or *c*.21% excluding Ostia.)

Hence, in terms of the number of persons per site type, there is some lee-way within the existing model to increase the overall suburban population. Assuming the maximum suggested figure for each site type doubles the total population to *c*.644,200 (119 persons/km^2). Whilst I

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[51] Witcher (2006b).
[52] Witcher (2006b).
[53] Fentress (forthcoming).
[54] E.g. Quilici (1974b).
[55] See also Duncan-Jones (1974, 259-87).

believe that such site population figures are too high, a *c*.20% increase on each site type is certainly feasible. However, there may be easier ways to find more people.

b. Recovery rates

All surveys should at some point consider 'recovery rates', that is, assessment of what percentage of sites has been identified and therefore what percentage of sites – and indirectly what proportion of population – is missing. It has long been recognized that survey recovers only a percentage of past settlement; a whole battery of depositional, post-depositional, and recovery processes operate to reduce the visibility of artefact scatters. Studies have considered factors as varied as the use of perishable materials, alluviation, land use, survey intensity, and individual walker bias. Again the long history of fieldwork in the vicinity of Rome makes it difficult to assess the impact of such processes. However, it is highly likely that an 'atlas' of all known sites would strongly reflect the significant variation in survey coverage and intensity, rather than genuine variation in past settlement patterns.[56] For this reason, rather than using known survey sites the model is based on a standard site density. The figure of one villa and two farms/km^2 in the area up to 50 km from Rome was based upon an assessment of the varied site densities recognized around the *suburbium*, but placed particular emphasis on more recent, high intensity surveys. Such surveys invariably recognize higher site densities and, though usually much smaller in spatial extent, provide a corrective to the older, more extensive surveys.[57]

Again, in terms of assessing whether or not the model can accommodate higher overall population totals, some allowance has therefore already been made for sites missed by older, less intensive surveys; the actual number of farms and villas recorded in the *suburbium* is far less than the hypothetical 16,000+ used in the model. However, the model does *not* make significant allowance for those sites missed for other reasons – e.g. those which are aceramic, undatable, destroyed, or deeply buried and undisturbed by the plough (to name but a few of the possible causes of low visibility). Of course, the problem is that there is no obvious means of assessing what percentage these missing sites might comprise – this is a (Rumsfeldian) 'known unknown'.

There have been various attempts to estimate survey recovery rates by comparing figures from historical texts with settlement numbers.[58] In the third/second century BC colonial context of the Ager Cosanus, a figure of *c*.20–33% site recovery has been suggested.[59] If this were also the case in the early imperial *suburbium*, then survey would have missed two-thirds or more of all sites. Clearly this would have profound implications for the reconstruction of population. However, it should be noted that the failure to identify, for example, two-thirds of sites does not equate with the failure to identify two-thirds of the population. This is because larger and/or richer sites are easier to locate than smaller and/or less opulent sites.[60] Villages and villas – and their larger populations – are therefore likely to be better represented than the inhabitants of farms. As a result, the percentage recovery of population is higher than the percentage recovery of sites.[61]

The model's baseline site density/km^2 was one villa (with a notional 50 ha/200 *iugera* estate) and two farms (each with 25 ha/100 *iugera* estates), totalling 41 persons/km^2 (or 60 including urban populations). This is already a dense site distribution in comparison with most other Italian regions; however, accepting that site recovery is incomplete, it is necessary to increase this density still further. Taking the 33% site recovery rate suggested for the Ager Cosanus, and assuming that it is easier to identify villas than farms, the baseline density might be increased to two

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[56] E.g. see maps in Amendolea (2004); Torelli (1992).

[57] Both Fentress (forthcoming) and Wilson (2008) correctly observe that the results of the very small survey at Corese (Di Giuseppe et al. 2002), used in the original model, may well not be representative of the wider area and lacks the inferential power of a probabilistic survey. However, whilst this may be true, the survey also provides an insight into the sites missed by the older and less intensive surveys of this region, following Cherry's (1983, fig.1) observation of the strong connection between survey intensity and the density of sites recovered.

[58] For a summary of figures from 20%–50% see Sbonias (1999, 4).

[59] Cambi (2001, 140).

[60] Schiffer (1987, 347).

[61] See Witcher (forthcoming).

villas (with 15 ha estates) and seven farms (with 10 ha estates) totalling 106 persons/km^2 (rising to 125 including urban populations).

However, taking c.1 ha per person per annum in a biennial fallowing system (i.e. 100 persons/km^2) as a baseline, then a population density of 106 persons/km^2 is moving towards the limits of self-sufficiency.[62] Further, it should be recalled that, as site densities increase, estate sizes decrease, so it becomes likely that the number of persons per site type also decreases; certainly it is difficult to imagine a scenario in which both maximum site population figures and a three-fold increase in site numbers would coincide. In addition, such consistently high density of sites makes no allowance for the common land needed to supplement the cultivation of individual properties[63] and little allowance for the surplus needed to pay taxes, buffer risk, and feed urban populations.[64]

How realistic then is the recovery rate of 33% of early imperial sites in the *suburbium*? Arguably, the third-century BC landscape of the Ager Cosanus was rather different from the early imperial *suburbium*. The former was a newly-founded (273 BC) and fragile colonial landscape (already in need of demographic reinforcement by 199 BC); in contrast, the early imperial *suburbium* was a mature and highly structured landscape closely integrated into the metropolis itself.[65] In particular, the abundance and diversity of diagnostic material culture, especially imported goods, suggests that early imperial suburban settlement is much more visible than the precarious colonial sites of the mid republic. As a result, it is likely that survey has recovered more than 33% of early imperial settlement in the *suburbium*. Exactly what percentage, however, is open to question.

In summary, some of the assumptions of the original model could be revised – most obviously making further allowance for site recovery rates and perhaps slightly larger populations at villas and towns. However, although site recovery is an issue of critical importance for survey in general,[66] recovery rates in the early imperial *suburbium* are arguably better than in most other regions of Italy. Hence it might be possible to double the suburban population total of the original model, but to take the figure much higher would require a fundamentally different model of social and economic organization, for which the evidence is as yet limited.

But what about the wider picture? If the 'high count' of c.14 million for the total population of Roman Italy is to be achieved, population density needs to be consistently high (although not uniform) across the whole of Italy. In other words, in order to assess the feasibility of the 'high count', it is necessary to look beyond the *suburbium*.

In considering the wider Italian population total, a vital consideration is the percentage of land under cultivation (i.e. the percentage of Italy to which a standard population density should be applied). Beloch and Brunt suggested 40%; I have suggested an increase to 50%.[67] However, on the basis that survey has subsequently attested settlement in quite remote areas (e.g. Casentino, Cicolano, Monte Amiata), this figure could *perhaps* be still further increased. Importantly, for the 'high count', the higher the percentage of Italy under cultivation, the lower the number of persons/km^2 that is required to achieve a population of 14 million. For example, generously

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[62] Rural population densities can certainly exceed the 100 persons/km^2 threshold, but a number of associated developments might be expected. For example, the shift from a biennial fallowing system to a more intensive crop rotation system often leads to improved integration of arable and pastoral strategies and, in particular, manuring; archaeologically this is widely associated with extensive off-site scatters (Alcock et al. 1994; Bintliff & Snodgrass 1988). Alternative strategies for supporting extremely high rural populations include the significant importation of foodstuffs (evidenced through amphorae) or changes in labour arrangements as the balance between people and land leads to declining wages and therefore more exploitative forms of dependency (e.g. tenancy, bondage). Certainly the best evidence from early imperial Italy for manuring and large-scale imports comes from the *suburbium*; however, even here the evidence is far from comprehensive (e.g. off-site scatters are very discontinuous; the vast majority of import amphorae relate to wine). More importantly, as discussed below, even if such systems had evolved in the *suburbium*, the evidence that they pertained more widely across Italy is almost non-existent.

[63] Evans (1980).

[64] Hopkins (1978); Horden & Purcell (2000).

[65] Witcher (2006b).

[66] Witcher (forthcoming).

[67] Beloch (1886, 439); Brunt (1971, 126); Witcher (2005).

assuming that 75% of Italy was cultivated (i.e. 187,500 km^2 – discounting only the one-quarter of Italy's surface area over 750 m),[68] a population of 14 million would require an *average* density *c*.75 persons/km^2 (including urban population). A more realistic 60% under cultivation would require population density to rise to *c*.93 persons/km^2. As demonstrated above, with small adjustments this density could be exceeded in the *suburbium*; it could even offset lower population elsewhere. But the physical extent of the *suburbium* comprised no more than *c*.10% of Italy. Therefore the 'high count' still requires high populations in non-suburban areas. How then do these figures relate to the survey evidence from other Italian regions?

Regionalism

Field survey has now been conducted in nearly every Italian region, encompassing a wide variety of environmental and historical contexts. Taken at face value, the density and character of early imperial settlement demonstrates considerable intra- and inter-regional diversity.[69] The most obvious pattern is the marked difference in the density of settlement; beyond the *suburbium* (and a few other areas such as parts of Campania) settlement density is significantly lower. This contrast is further reinforced when site density is converted into population density. For example, if the same basic methodology as outlined for the *suburbium* is applied to the Biferno valley survey results, the early imperial population is the equivalent of just 3.4 persons/km^2, or 7.4 including urban populations (Table 3).[70] A similar model for the Albegna valley recently proposed by Fentress calculates 19 persons/km^2, or 21 including urban populations.[71] Further afield, in Laconia (Greece) the Roman rural population is calculated at 8.2 persons/km^2,[72] and on the island of Jerba (Tunisia) the density is 22 (or 52 including urban).[73]

Table 3. Demographic model of the Biferno valley in the early imperial period (based on data from Barker 1995). NB as towns were not identified as part of the survey, there is no need to correct for the 20% sample.

	Towns	Village	Village/villa	Villa	Farm	Domestic site	Sporadic	Totals
Sites identified (*c*.20% sample)	3	5	2	14	34	34	19	111
Total number of sites (x5)	3	25	10	70	170	170	95	543
Persons per site type	2500	100	50	25	8	2	1	-

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[68] Certainly, elevation is a rather crude measure of the extent of cultivation, and in favoured areas settlement existed even above 1,000 m (e.g. Iuvanum: Bradley 2005); however, on a broader scale, cultivation becomes significantly more difficult above 750 m. By way of comparison, in 1997 only *c*.47% of mainland Italy was under cultivation (Loseby 2000: table 18.3).

[69] E.g. for Etruria see Witcher (2006b).

[70] For a more sophisticated version of this exercise see Wilson (2008). Two obvious points of contrast between the figures for the Biferno valley and the *suburbium* (Witcher 2005, table 2) are the demographic importance of villages (18%) and towns (53%) in the former area; this may be of direct relevance to the discussion of low recovery rates (see below).

[71] Fentress (forthcoming).

[72] Cavanagh et al. (1996).

[73] Fentress (forthcoming).

Total population per site type	7500	2500	500	1750	1360	340	95	14045

Although these demographic models all use the same basic methodology, the specific details vary (e.g. site type populations) and as a result the figures may not be strictly comparable (though there is no reason that there should be, for example, a standard Mediterranean-wide family of five). However, all of these figures (except those for Jerba) are much lower than the 60 persons/km^2 originally calculated for the *suburbium*. Indeed, in the case of the Biferno valley the difference amounts to a whole order of magnitude (*c*.7 against 60 persons/km^2). Obviously, it is possible to increase these site densities by adjusting these models' assumptions, for example, assigning larger populations for each site type. However, in the case of the Biferno valley, farms would need populations more akin to villages in order for this method to increase the overall population density to suburban levels.

The alternative is to consider recovery rates in order to find more sites and hence higher population. In particular, if, as suggested above, sites are particularly visible in the *suburbium* because of the great abundance and diversity of early imperial material culture, it is valid to question whether or not the marked decline in site density with distance from Rome is real. In other words, are site recovery rates in areas such as the Biferno valley substantially lower than in the *suburbium*? This question cuts to the core of the 'high/low' population debate, for it exposes what must be believed about the archaeological record in order for either of these text-based figures to be accepted. In order to comprehend the arguments and the implications more clearly, the following sections sketch two alternative models which characterize the uneasy ways in which the textual and archaeological evidence have been harmonized. The models are presented on the basis that discussion of the early imperial population of Roman Italy has polarized between either 'high' (*c*.14 million) or 'low' (*c*.7 million) and that an intermediate compromise figure is excluded by the terms of the debate.

'Low count'

This model starts with an early imperial Italian population of *c*.6–7 million.[74] In order to reconcile this low figure with the archaeological evidence, it is necessary to assume that survey recovers a significant percentage of sites. This is because the densities of sites (and population) directly attested by survey are already sufficient to achieve a population of several millions if extrapolated across Italy as a whole. By the time recovery rates are factored in, a population of *c*.6–7 million is within easy reach. A recovery rate of *c*.50% or more of sites would be sufficient. In this scenario, survey identifies the majority of sites and therefore this model might be characterized as "What You See Is What You Get". This means that the patterns and trends in the data can be accepted more or less at face value. For example, the significant regional variation in site numbers should be accepted as representing a genuine contrast in settlement and population density – several, perhaps even ten, times higher in the *suburbium* than in areas such as the Biferno valley in Samnium. It follows that this model presupposes that a disproportionate percentage of Italy's *c*.6–7 million population lived in the *suburbium*; in turn, this concentration of population is likely to have had important implications for the economic organization of early imperial Italy.

Another corollary of high recovery rates is the socio-economic status of rural populations. The ability of survey to recognize a majority of sites assumes that rural populations were well integrated into urban and regional economies through the consumption of finewares and other manufactured/imported goods on which survey relies to identify sites. These goods were presumably exchanged for agricultural surpluses at local markets. In other words, the assumption of

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[74] Brunt (1971); Hopkins (1978).

high recovery rates requires a conceptualization of rural socio-economic organization akin to Horden and Purcell's Mediterranean peasantry.[75] Far from the independent and autarkic citizen-soldier eulogized in Roman literature, these rural populations were involved in agricultural production well beyond subsistence, the constant redistribution of surplus through regional social and economic networks, and the consumption of manufactured/imported goods.[76]

'High count'
The alternative model starts with an early imperial population in of *c*.12–14 million.[77] In this case, the archaeological evidence is reconciled with the 'high count' by assuming that survey recovers only a small percentage of sites, far below 50%, perhaps as low as 10–20%; this is because there are simply too few 'dots on the map' to accommodate a population of *c*.14 million. For 'high counters', it is therefore necessary to believe that survey fails to recognize the majority of sites and therefore population.

In order for the 'high count' to be valid, large swathes of land such as the Biferno valley simply cannot have been as thinly settled as they appear. Rather, to raise the calculated population of the Biferno valley to the notional 'high count' average of *c*.75 persons/km^2 (see above), it is necessary to assume that the survey recovered *c*.15% of villages, 8% of villas, and just 2% of farms and other scatters (Table 4). These percentages can be redistributed between site types, but the general point is clear – on average the survey recovered less than 5% of sites and *c*.10% of the population (just 14045 of 139275).

Table 4. Effects of hypothetical recovery rates on demographic model of the Biferno valley in the early imperial period (based on data from Barker 1995).

	Towns	Village	Village/ villa	Villa	Farm	Domestic site	Sporadic	Totals
Total sites (see Table 3)	3	25	10	70	170	170	95	543
% site recovery	100%	15%	15%	8%	2%	2%	2%	-
Multiplier	1	6.7	6.7	12.5	50.0	50.0	50.0	
Actual number of sites (rounded)	3	168	67	875	8500	8500	4750	22863
Individuals per site type	2500	100	50	25	8	2	1	-
Total population per site type	7500	16800	3350	21875	68000	17000	4750	139275

However, a compensatory tenfold increase across all Italian population densities would result in unacceptably high figures in, for example, the *suburbium* (i.e. 10 x 60 = 600 persons/km^2). It is therefore necessary to accept that, under the 'high count' model, rather than regional variation in site/population *density*, survey reveals regional variation in site/population *recovery rates*. In other words, the people are there but the ability of survey to recognize them is regionally variable; the vast majority of these *c*.14 million persons are invisible.

Why should some populations be more or less visible than others? The obvious answer is variation in evidence used to identify these populations, i.e. (principally) ceramics. Hence, whilst

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[75] Horden & Purcell (2000, 270-7).
[76] Witcher (2007).
[77] Lo Cascio (1994; 1999).

some rural populations (mainly those in the *suburbium*) conform reasonably well to the Horden and Purcell model (see above), a rather different model must have prevailed in more distant areas, such as the Biferno valley. Here the very low recovery rates imply extremely densely occupied landscapes but with very limited consumption of manufactured/imported goods. In contrast with the 'low count' model, this suggests impoverished subsistence peasants with minimal economic contact with urban markets. Clearly the monumentalization of early imperial urban centres was not paralleled by the social and economic integration of their rural hinterlands;[78] for some areas of Italy therefore the 'high count' would presume a return to the consumer city model. In sum, for the 'high count', though there may well be some variation in regional population density, the implicit differences in social and economic organization are far more significant. The apparent failure of survey to recognize *c*.80–90% of the population actually reveals fundamental socio-economic differences across Roman Italy.

Discussion

The 'high' and 'low counters' have begun to explore the logical implications of their figures in order to identify proxies with which to support their positions. Arguably, however, these implications (e.g. levels of conscription, labour wages) have not explicitly considered the archaeological evidence and how interpretations of it must differ. The two models outlined above highlight that the 'high' and 'low counts' have profoundly different interpretations of the archaeological evidence. For example, in order to accept the low figure it is necessary to accept that survey recovery rates are high; in turn, this must reflect a socially and economically integrated, high consumption society. Importantly, therefore, these models connect the 'high' and 'low count' assumptions about survey data to the processes which generated the archaeological record; that is, the actions of individuals within particular social and economic systems.

Scholars have increasingly found it difficult to choose between an Italian population of *c*.7 and 14 million;[79] both figures have useful explanatory power (e.g. the 'high count' reduces the extremely high conscription rates assumed by the 'low count'; the 'low count' better explains the widespread use of slavery). Similarly, it is difficult to choose between the two 'archaeological' versions of the 'high' and 'low counts' presented here (e.g. the 'high count' is based on the *absence* of evidence); the models do, however, encourage explicit assumptions and logical thinking. For example, it would seem difficult to sustain the simultaneous assumptions that population was high and that rural populations were economically integrated.

But how might we approach the archaeological evidence without the 'fixed points' provided by the 'high' and 'low count' figures? In other words, how would we interpret the archaeological evidence independently of the texts? Unlike the text-based debate, these two archaeological models are not necessarily mutually exclusive. Arguably, an intermediate population total would make better sense of the evidence as we currently understand it. Hence, there were more sites closer to Rome of which a higher percentage has been recovered. Conversely, there were fewer sites further away from Rome, of which survey has recovered a lower percentage. This interpretation is also apparent when comparing, for example, the *suburbium* with Samnium: the quality and quantity of material culture and the form and distribution of villas are quite distinct and are plausibly interpreted as differences in both population *and* recovery rates. Further, these assumptions about the interpretation of the archaeological data might not only be compatible, they may also actually be correlated. For example, a small population might have an aggregate demand which is insufficient to maintain a specialist craftsman; this population might therefore be both smaller and *disproportionately* less visible.[80]

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[78] For recent discussion of the close and shifting relationship of towns and their hinterlands during the early imperial period, see Patterson (2006, 269-78).
[79] E.g. Morley (2001); Scheidel in this volume.
[80] Witcher (2007)

Such an interpretation is not just a case of dismissing the textual evidence and 'splitting the difference'; we still have to acknowledge the census figures. However, it is important to question the assumption that the textual and archaeological evidence should neatly agree. As stressed above, these sources relate to phenomena (censuses, ceramic consumption, settlement patterns, etc.) which are only very loosely connected; the evidence is also received or recorded in quite distinct ways. Indeed, we might well be suspicious if the texts and archaeological evidence did conveniently agree given the wildly varying estimates of key variables (e.g. the number of citizens overseas, etc.). Hence, we should expect *some* relationship between the textual and archaeological evidence but not a straightforward one. Arguably, the fact that the archaeological figures are already within the same order of magnitude as the census figures should be considered worthy of remark in its own right.

The argument for an intermediate figure does not require us to reject the historical texts out of hand. Hin proposes a new reading of the historical texts which offers one possible alternative to the 'high' and 'low counts'.[81] Hin's 'middle' figure provides a maximum population of 10 million, but she argues that the actual population was somewhat less. This sensibly avoids the temptation or necessity to quantify variables for which we have, in reality, limited information (e.g. census *over*registration). I do not suggest that Hin's 'third way' provides direct support for an intermediate archaeological figure and much less that it should coincide with such a figure; simply, that the current polarization of interpretation between 'high' and 'low counts' is increasingly inadequate. I suggest that there is no need to force the archaeological data to fit the 'high' or 'low count' figures, not least because intermediate figures are possible on text-based grounds as well. However, perhaps the key point highlighted by these models is not the scale of the population *per se*, but the fact that they all imply regional variability of either population and/or socio-economic organization across early imperial Italy. *Tota Italia* was not a uniform Italia.

Conclusions

Modelling absolute population figures with survey data is not undertaken in the belief that the resulting numbers are real (i.e. precise, conclusive, etc.). Rather, these are "models for thinking": they serve to highlight assumptions and logical problems which help to advance understanding; they also help to develop comparisons between different periods and regions. In this sense, survey data can most definitely contribute to the study of Roman demography.

The example of the South Etruria survey is instructive. Here a distinct decline in the number of Late Republican 1 sites would appear to support the historical model of second century BC (citizen) population decline; however, an assessment of the processes which lie behind this settlement trend (in particular, the deposition and sampling of black gloss pottery) reveals that this pattern is insufficiently robust to support such an interpretation conclusively. This is not to argue that it is impossible to address this issue archaeologically, but simply that the characteristics of this particular dataset mean that it cannot be used to address this issue with any certainty. This example helps to reveal the problems of stretching the (interpretation of) archaeological evidence to support the (interpretations of) textual data. More broadly, it also illustrates that the basic demographic modelling methodology outlined here cannot be used indiscriminately. Numerous issues of archaeological visibility (from variation in the consumption of material culture to differences in modern land use) mean that this technique may be applicable only to a few special combinations of period and place – arguably one of these is the early imperial *suburbium*. Fortunately, the special cases where it is applicable provide baselines from which to consider the evidence of other periods and places. For example, the large population of the early imperial *suburbium* did not appear from nowhere; it must relate closely and logically to the late Republican population.[82]

A re-evaluation of some of the assumptions behind a demographic model of the early imperial *suburbium* suggests that it may be possible to increase the population still further; particularly through greater allowance for recovery rates. Overall, however, the special conditions

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[81] Hin, in this volume.
[82] Witcher (2006b).

of the *suburbium* (most importantly its metropolitan-style consumption practices) mean that recovery rates are less problematic here than for many other regions of Italy. In order to assess the impact of recovery rates, models have been framed around the 'high' and 'low counts'. These models foreground a number of quite distinct and implicit assumptions made about the interpretation of archaeological survey data. In particular, the 'high count' assumes very low recovery rates; in turn this suggests relatively unintegrated rural economies and low consumption. In contrast, the 'low count' assumes high recovery rates; and this suggests a more integrated rural economy with extensive access to manufactured/imported goods. The models in themselves do not resolve the 'high' vs. 'low count' debate, but they do provide an archaeological perspective on (what has been to date) a primarily text-based dispute.

Beyond the issues involved in the 'high' and 'low counts', the models stress further the growing evidence for the variability of early imperial Italy. Whichever model (or combination of models) one chooses, *regionality* is the theme which repeatedly emerges: either in terms of population (as evidenced in differences in settlement density) and/or in terms of socio-economic organization (as implied by variation in survey recovery rates). In turn, better recognition of the importance of regionality for our understanding of the demography of Roman Italy should encourage new perspectives on old problems, such as the second century BC population decline.

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