Chapter 15

Settlement Hierarchies, Territorial Divisions, and Visual Dominance*

1 INTRODUCTION

The late protohistoric (Late Bronze Age/Early Iron Age) settlement pattern in the south, as in central Italy, has been interpreted as one indicative of the transition of pastoral ways of life to one dominated by agriculture and increasing hierarchisation of society, culminating in the rich graves of Iron Age elites in all areas of Italy and in evidence for early urbanisation in many regions but apparently developing first in Etruria and Lazio. Among the causative factors, the presence of exploitable mineral resources has been suggested (Vanzetti, forthcoming); the persistence of tribal structures in the Sibaritide seems to confirm this idea which may be combined with that of a difference in demographic ‘carrying capacity’ due to geological and climatological differences which translated into different potentials for land use and the relatively late take-off of urbanisation.

Late protohistoric centralised settlement has been interpreted as evidence of a territorial division in which each settlement laid claim to essential landscape resources, with an initial phase of peer polity interaction being followed by one in which a single settlement obtained hegemony and others are relegated to 2nd rank (Rome in Lazio, Torre Mordillo in the Sibaritide). The further development of this system seems to have been aborted in the Late Iron Age and the Archaic/Classical period in the south when economic life re-oriented on the successful colonies; in central Italy it was the hypertrophic development of Rome which disturbed the equilibrium.

Peer polity interaction is an inherently unstable system because it will be upset whenever any of the polities gets preferential access to resources. Rome, as a ‘border’ polity of the Latial league, could enlarge its territory through conquest to its north and west, and through its position on the Tiber could control and profit from river-borne and coastal trade. These options were largely closed to the ‘central’ polities of the Alban hills. However, in its developed form the peer polities of the Pontine, Sibaritide, and Salento regions were modelled using Thiessen polygons (Bouma & Van ‘t Lindenhout 1998, Peroni 1994:282ff. and 1996, Burgers 1999) under assumption of equality and a simple rank-size hierarchy consisting of just two levels.

Because of the research interests of the culture-historical paradigm (Formazione delle città, urbanisation, and colonisation; see chapter 2) and the limitations inherent in site databases collected before the advent of modern ‘landscape’ surveying (chapters 4 and 13), theorising about settlement patterns has been limited

* These case studies are concerned with two of the three study areas only; case studies involving the rank-size analysis and X-tent modeling of late Iron Age to Archaic settlement in the Salento Isthmus could not be completed in time for this thesis.
to the top of the settlement hierarchy in the three study areas. Even in regions with a relatively high-quality data base, typological classifications of these settlements have had to be based on locational characteristics or size of inhabited or defended area. For example, Guaitoli (1977:22-25) classified the protohistoric to Archaic settlements of Lazio into 'coastal', 'crater-rim', 'military-commercial', and 'minor' groups; he gave no size-rule to support these classes. By contrast, Guidi (1985) applied a rank-size analysis to the same set of settlements, estimating settlement size from the area bounded by natural defenses, and concluded for the late 7th century BC (orientalizing period) that there was evidence for the development of a three-level hierarchy with Rome at the top, Ardea and Gabii at level two, and other towns dependent on these three at level three.

Settlement size plays a central role in all models of late protohistoric and archaic societies in Italy, from Etruria and Lazio to the Salento and the Sibari tide. In the large majority of cases, sizes are estimated on the basis of three assumptions: finds from slopes and valley floors originate from hilltops and plateaus; these hilltops and plateaus were entirely rather than locally inhabited; and habitation is assumed to be continuous even if some phases are not well represented at a settlement (Vanzetti, forthcoming). Moreover, given the current state of research many settlements of significant size still remain undiscovered. For these reasons, any specific models of territorial organisation based on rank-size criteria must be regarded as weak.

Whatever the problems in establishing the size and rank of protohistoric settlements, the locations of what has been regarded as the upper-rank settlements are generally described as ‘dominant’, expressing their elevated, easily defensible positions and large viewsheds within which essential landscape resources such as transhumance routes were located. This opens up the possibility of studying the viewshed properties of these settlement systems and the landscape that they are part of. In order to explore further the issues raised in this introduction, three interrelated case studies are presented here in two chronological sections. The following section presents a protohistoric and pre-colonial case study regarding accessibility, visual contact, and territorial structure in the Sibari tide and the Pontine region; the final section presents a case study of the Roman colonial landscape in the Pontine region. The hierarchisation of protohistoric settlement systems on the basis of size and locational characteristics is examined with reference to Peroni’s (1994) models for southern Italy, the territorial organisation of Late Iron Age to Archaic early states is explored through visibility and accessibility analysis with reference to Bietti Sestieri’s (1985) models for Lazio; and the role of strategic considerations in the location of early Roman strongpoints in the Pontine region (south Lazio) is considered through an investigation of 4th century BC colonies on the Lepine scarp, in the context of Livy’s historical references.

2 SETTLEMENT AND TERRITORY IN PROTOHISTORY

THE SIBARITIDE

The locational characteristics of the larger settlements of the south Italian Bronze and early Iron Ages are generally understood to be a function of both local (defensibility, available area, presence of sufficient agricultural land) and regional criteria (a ‘commanding’ position, sufficient distance from neighbouring settlements, access to both low- and highlands). However, there is a measure of vagueness in the way these criteria are applied. In the case of the Sibaritide, a review of the literature reveals the following suggestions for the operationalisation of geographical models of Middle Bronze Age to Early Iron Age societies:

- **Defensibility** - This is taken to require a cape- or promontory-like geomorphology; candidate locations should be accessible from one direction (upslope) only, the other directions being characterised by steep slopes. No specifications are given for the amount of steepness considered sufficient.
• **Available area** - Depending on whether a settlement is thought to fulfill mainly habitation or defensive functions, the criteria for available area may specify a lower or an upper limit, or both. Except in cases where the area of a settlement has in fact been measured from evidence of walls etc, the available area can only be specified as a contiguous block of land of less than a specified slope, e.g. 16 percent.

• **Presence of sufficient agricultural land** - The two factors making up this criterion are ‘sufficient’ and ‘agricultural’. The amount of land to be considered sufficient for a specific settlement depends obviously on the amount and type of produce being consumed or traded from there. From the Middle Bronze Age onwards, a spreading of dry farming techniques into the uplands has been proposed by Barker (1985), while in the Final Bronze Age olive culture is added to the range of agricultural techniques. In the Sibaritide the soils of the marine/fluvial terraces are considered fair agricultural land for dry farming of grains and vegetables, as long as slopes are not so steep as to cause erosion. However, given the relatively small size of even the major settlements of the Bronze and early Iron Ages, this factor is unlikely to have much restricted settlement location. Kleibrink suggests that the 25 ha of agricultural land available near the settlement of San Nicola (Peroni & Trucco 1994, site 31) would be sufficient for it. The remaining land, including that located on lower quality soils and on slopes, could have been used for olive culture.

• **A ‘commanding’ position** - This criterion is not specified by the authors, but is usually interpreted as signifying that the settlement should have an unusually large viewshed and/or an unusually complete ‘near’ viewshed. A second potential characteristic of a commanding position is that of easy access to whatever is being ‘commanded’, but the latter remains unspecified except as a minimum or maximum vertical distance of the settlement from the nearest valley floor. For the Sibaritide one can think of: summer and winter grazing and other economic interests; settlements, cemeteries and other social interests; the coast, long distance routes and other strategic interests.

• **Sufficient distance from neighbouring settlements** - From the Middle Bronze Age onwards, and accelerating toward the Final Bronze Age under the influence of technological change and demographic growth, the undifferentiated settlement system of the Early Bronze Age in the Sibaritide is thought to have crystallised into a hierarchical system of major and minor settlements. The territories of the major settlements are bounded by the valleys of major streams; where such streams are close together the operative criterion may be ‘social’ distance as well as size of territory. In the Sibaritide in the Early Iron Age this distance appears to be on the order of 15 km; major settlements of the Salento Murge typically are some 12 km apart in this period. These central villages would begin to function as redistribution centers from the Late Bronze Age onwards, as is shown by the evidence for storage of large amounts of agricultural produce at Broglino di Trebisacce (Levi 1999:229). The minor settlements in this system are thought to have strategic functions: either to provide safety from attack or cattle raids from the direction of the uplands, or to control the crossings of the litoraneo protostorica over the main river valleys.

• **Access to both low- and highlands** - The economic unit of which the settlement is the archaeologically most visible part would have included parts of the coastal plain and the uplands as well as the footslopes. In addition to the summer and winter grazing for livestock, sufficient untended and wooded land would have been needed for hunting, gathering, fishing, fowling and the extraction of wood, clay and other natural resources. For example, analysis of the animal bones excavated at Broglino di Trebisacce indicates hunting on a small scale and animal husbandry of cattle, sheep, goats and pigs; the livestock was kept for milk, labour, and wool rather than for meat; exploitation of the coastal environment is evident from the occurrence of tortoise remains (A. Tagliacozzo in Peroni & Trucco 1994: 562-652). Social life would have demanded access to cult places such as caves, springs, and mountaintops. In the Sibaritide the karstic cave sites, e.g. the ones in the S. Marco and Pollino mountains, are situated upslope of the settlements, which they visually dominate. Kleibrink (forthcoming) posits a major change in the cultic landscape of the Sibaritide following the Middle Bronze Age, in that the ancestor worship as practised from at least the Neolithic until the Middle
Bronze Age in caves, gave way to more public ceremonies in the Late Bronze Age, in which the leaders were involved in votive deposits of metal implements in lakes, rivers and near springs and mountain passes. The main infrastructure in the Sibaritide would have consisted of short transhumance routes following the spines of the major hill systems until joining inland long distance routes such as the ones postulated by Quilici (De Rossi et al. 1969:59-67); other routes would have connected the settlements themselves. Kleibrink (forthcoming, par 2.7) suggests that the higher settlements on calcareous outcrops will have been under the control of the lower, larger, ones and linked to intensive pastoralist movement.

In all this, a number of other potential settlement location factors have not yet been mentioned: access to and control over routes along the Crati and Coscile valleys into the hinterland and the opposite (Tyrrhenian) coast of Calabria; the presence of a favourable microclimate; and the presence of a pre-existing cognitive landscape. The significance of access to the coast, at least from the Late Bronze Age onwards, has been said to lie in the general growth of overseas contacts with the eastern Mediterranean. And indeed, as Kleibrink writes, the archaeologically attested exchange of objects and technology indicates that during the Late Bronze Age overseas contacts were frequent (Peroni 1994:24) and presumably profitable for both the Italic peoples and the traders from the eastern Mediterranean. However, a more plausible reason may be found in the needs of pastoralism: could access to winter grazing in the plain, which at this time would have been a heavily wooded and seasonally flooded marginal area with soils generally too stony or clayey for paleo-technic agricultural use – have been so vital as to be the determining element in settlement type and location choice? The role of the cognitive landscape in settlement location is suggested by M Kleibrink (forthcoming, par 4.2), who posits a ‘tabu’ landscape around the San Marco cliffside near Cassano all Ionio, where ancestor worship is said to have taken place in caves up to and including the Middle Bronze Age. During the Late Bronze Age, while ritual dedications in caves severely declined, votive deposits of metal objects became much more popular all over Italy (Bianco Peroni 1978/1979). Evidently the focus of cultic life shifted from ancestors in far-away places to nature gods and places that could be reached more easily from the settlements.

IMPLEMENTATION

Our database consists of sites listed by Peroni & Trucco (1994); both habitation and cemetery sites are here taken into consideration. For the Middle Bronze Age (1600 - 1300 BC) there are ca. 17 of these, for the Recent Bronze Age (1300 - 1150 BC) ca. 19, and for Final Bronze Age/Early Iron Age (1150 - 900 - 700 BC) ca. 38. As shown in figure 1, in the Middle Bronze Age the Sibaritide foothills - marine and fluvial terraces consisting of sands and conglomerates – are thought to have been in use for cereal cultivation and some cattle breeding; in the Recent Bronze Age land use may have shifted back toward pastoralism tending toward higher elevations, mainly in the interior, a tendency continuing in the Final Bronze Age. In the Early Iron Age new settlements emerge mainly in the interior, possibly for strategic reasons but as we shall see this may also be related to a stonger emphasis on agricultural territory. Peroni (1994, fig. 96) suggests that in this period peer polities developed as well, most of which controlled territories incorporating sections of the plain, foothills, and upland.

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<th>Table 1: Classification of protohistoric settlements in the Sibaritide (D'Angelo &amp; Oräzie Vallino 1994).</th>
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Underlying Peroni’s phase maps is a site type classification by D’Angelo and Oräzie Vallino (in Peroni & Trucco 1994:827-8), who established the following classes for protohistoric settlement in the Sibaritide:

1. settlement and cultivable land in a well-defended area
2. elevated sites in protected conditions, but with little cultivable space – hence suitable for small communities only
3. settlement in a well-defended position, but with cultivable unprotected land nearby – some suitable for large communities, some for small
4. settlement and cultivation possible, but only limited natural defences present
5. sites with properties mainly useful for pastoralists
6. sites whose main function lies in their viewsheds

![Figure 1 - Protohistoric site distributions in relation to lithotypes, after Peroni 1994, figs. 83, 86, and 96. Top left: Middle Bronze Age subsistence economy. Top right: Final Bronze Age animal husbandry. Bottom: Early Iron Age territories. Open circle: site continued from previous period; closed circle: new site; cross: site discontinued from previous period. Oblique hatching: lithoid formations; Vertical hatching: non-terraced sands and conglomerates; Stippling: terraced sands and conglomerates suitable for crops; Blank: recent sediments.]

The totals by class are as follows: class 1: 10; class 2: 10, class 3: 4; class 4: 4; class 5: 7; class 6: 6. Classes 1 and 3 would contain the top-ranked settlements, classes 2 and 4 are minor centres, and 5 and 6 are special

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1 Not specified, but possibly a location along, or near nodal points in, the network of transhumance routes was meant.
purpose sites. The table below lists their classification of 36 sites in the Sibaritide. Note that the classes are not separated by unambiguous criteria – the difference between classes 1 and 4 is in the quality of the natural defences, that between 1 and 3 in the presence of cultivable land outside rather than inside the defences, that between 2 and 6 (presumably) in the quality of the viewsheds. In all this, it must be remembered that the actual archaeological evidence from many of these sites can be as little as a handful of sherds.

**ZONES OF VISUAL CONTACT**

On the basis of the distribution of these site types in the landscape, pairs of settlements occupying single hill systems have been identified, consisting of one larger settlement situated at lower altitude and with sufficient agricultural land nearby, and one smaller defensible settlement at a higher altitude\(^2\). An example of the former type is the site of Monte S.Nicola, occupying the saddle and sides of two hills overlooking both the coastal plain and the valley of the Raganello river at an altitude of about 500m asl. If we assume that the protohistoric settlement pattern was largely based around a pastoral land use pattern (with transhumance route between summer and winter pastures following the radial ridges and streams of the Sibaritide, and valleys forming obstacles rather than routes), then sites such as Monte S.Nicola should have certain viewshed characteristics. In particular, the locations of any hilltops from which, coming from the summer pastures in the uplands, winter pasture in the plain first comes into view. We can model such locations by calculating viewsheds from several points in the plain.

The general context for Peroni’s models of protohistoric settlement systems is provided by the physiography of the Sibaritide, in particular its radial geomorphology and hydrography. Within such a landscape, areas with similar viewshed properties can be modeled without having recourse to the locations of known sites and using ‘background’ visibility properties instead (see also chapters 6 and 16). Such areas can be defined by simple criteria and can be organised hierarchically, for example:

- all locations from where a significant part of the coastal plain or the major valley floors can be seen; this includes the plain and valleys themselves, the edges and slopes of terraces, and the higher slopes of the Pollino and Sila ranges which face the plain
- all locations from where no part of the plain or valley floor can be seen; this includes the highlands, secondary river valleys, and the interior of the terraces

To explore such a model, four unrestricted viewsheds were calculated for points lying on the coastline at the mouths of the Raganello and Crati rivers and at two other points to the north and south\(^3\), plus seven more viewsheds of 10km radius based on four points located on the plain along the base of the foothills and three points within the major valleys of the Coscile and Crati. When combined, these viewsheds do indeed define the intended visual zones (see figure 2a). By including known protohistoric settlements in this model, their degree of association with single zones or, conversely, their liminality with respect to these zones can be assessed and interpreted. Liminal sites should be located near the edge of a visual zone but still within the visible area. Protohistoric sites which lie on the outer edge of zone B can be interpreted as essentially inland sites situated as close as possible to the coastal plain; protohistoric sites that lie on the outer edge of zone C might be related to transhumance routes and the point where these begin to descend into the plain; sites on the inner edge of zone C are ‘foothill’ sites situated for visual control of the largest possible area of the coastal plain; and sites that lie within the secluded parts of zone C are ‘plain’ (presumably agricultural) sites with no significant viewshed characteristics. A first inspection of the model presented in figure 2a suggests that it might indeed be possible to group protohistoric sites according to such viewshed properties; a better controlled and more detailed study will, however, be necessary to substantiate this.

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\(^2\) Authors disagree as to the hierarchical relation between the pair. Peroni regards the higher site of each pair as the main settlement; Kleibrink the lower. This is not important for the GIS analysis and in the end may be a meaningless difference as both sites of a pair can be said to form integral parts of one socio-economic system.

\(^3\) These points are located at co-ordinates 2650373/4412196; 2647225/4404081; 2651038/4398140; and 2652413/4390424.
The utility of the concept of visual zones can be further explored by comparing them to the viewsheds of individual protohistoric sites. Figure 2b presents one such viewshed, calculated from the site of Torre del Mordillo, probably the most important indigenous settlement at the time of the first Greek colonisation. It can be seen that the site has a very large viewshed, covering both the coastal plain and much of the major inland valley floors and slopes. Because of its relatively elevated position on the rim of a marine plateau, its viewshed also includes several of the ‘secluded’ areas not visible from lesser elevations.

When the locations of Hellenistic/Roman farmstead sites in the Quilici dataset are included in the model as well, it becomes apparent that the linear clustering observed by Quilici is related to specific geomorphological settings, for which explanations may be sought not just in viewshed properties but also in microclimatic variations. Finally, the significance of zones which tend to be ‘hidden’ from most of the plain and valleys (or conversely, from where these areas cannot be seen; indicated by dotted lines in figure 2a) could be further explored. Examples of such areas are the plateaux of Caccavato/Praineto north of the Coscile river and Lauropoli in between the Coscile and the Raganello, and the valley of the Eianina at S. Marco. Interestingly, Kleibrink in a forthcoming article suggests on the basis of other evidence that the latter area might represent a protohistoric ‘tabu’ landscape (Kleibrink, forthcoming).

THE ALBAN HILLS

The sites and monuments of the Alban hills were the subject of spatial studies by topographers early on. Settlements, cult places, and ‘tombe principesche’ from the later Iron Age onwards were related to historical and infrastructural evidence, and interpreted in the context of the ‘formazione delle città’, the

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4 By reason of its size and commanding position on a plateau overlooking the confluence of the Crati and Coscile rivers.
formation of early city states. Such studies have continued more recently (cf. Bietti Sestieri 1985, Chiarucci 1996, Arietti 1996), with the emphasis shifting towards models of the spatial organisation of the indigenous Latial societies. The spatial organisation of the landscape of the Pontine region has most recently been investigated diachronically in five phases between 700 and 300 BC by Bouma and Van ‘t Lindenhout (1998) with the help of Thiessen polygons. These authors identify a general diachronic trend, beginning in the Tiber Valley and continuing in the Pontine region, of centralization towards a smaller number of increasingly urbanised settlements and an attendant simplification in Thiessen polygons. Bouma and Van ‘t Lindenhout conclude that the Iron Age Latial system of peer polities was still intact during the Archaic period (6th century), and began to collapse only towards the end of the 5th.

As in the single-period models advanced by earlier writers, this diachronic approach is based on some very shaky assumptions regarding the status and contemporaneity of (proto-) urban polity centres. The dangers involved can be illustrated by these authors’ discussion of cult places in the context of their location in a territorial centre, on a territorial boundary, or inside a territory (1998:97-100). In particular, there is a potential circularity of argument involved in the fact that any particular set of Thiessen polygons is the consequence of a decision to regard a certain group of sites as ‘equal’ within a settlement hierarchy; the polygons or their characteristics cannot then be used to prove that this was the case. Moreover, their argument that the presence of a cult place in a settlement is supporting evidence for its function as a polity center is weak because it assumes that the absence of cult places is not due to the chances of discovery. Again, their conclusions are often based on the appearance or disappearance of single centres in the network of polygons, and so are very sensitive to the chance presence or absence of occupation evidence for any single period. This sensitivity of Thiessen polygons to changes in the set of ‘seed’ settlements is demonstrated by overlaying Franco Arietti’s alternative hypothetical territorial model of the central Alban area in the later Iron Age on that of Bouma and Van ‘t Lindenhout (Arietti 1996, fig. 3): applying different criteria to decide which protohistoric sites were territorial centers, Arietti adds the centers of Labigi, Lanuvium and Alba Longa (postulated at Castel Gandolfo) to the list used by Bouma and Van ‘t Lindenhout with obvious consequences for the sizes and shapes of the resulting territorial division (see figure 3).
Whilst Thiessen polygons can be 'weighted' to reflect the differing sizes or populations of the polity centers in a peer polity system, they were never intended to model the territories of a hierarchical set of centers. For such a case, central place theory and X-tent models (Renfrew & Level 1979) are more appropriate. Guidi (1985), applying a rank-size analysis to the settlements of south Lazio in four chronological phases (corresponding to the 10th, 9th, 8th, and late 7th centuries BC), estimates settlement size from the area bounded by natural defenses. For 7th century south Lazio he concluded (1985:232) that there was evidence for the development of a three-level hierarchy with Rome at the top, Ardea and Gabii at level two, and other towns dependent on these three at level three. If the large number of minor sites for which no size data are available were included, he argues, then the rank-size graph would take on a 'primoconvex' shape which indicates a high level of integration for the larger sites but a low level for the smaller ones. These results suggest that the assumptions underlying the territorial analysis by Bouma & Van 't Lindenhout and Arietti are not well supported. Given the lack of discussion of these issues, it appears that these authors are not aware of the extreme sensitivity of the Thiessen polygon technique to even small changes in the input data set.

3 ROMAN COLONIES OF THE LEPINE SCARP

As the influence of Rome over affairs in the Pontine region grew in fits and starts during the post-Archaic period, and intermittent conflict with neighbouring tribes became more disruptive, so the development of the indigenous Latial peer-polity system was replaced by one of a core-periphery system in which the Pontine plain first became the scene of a drawn-out conflict between the expanding early Roman state and the rather less clearly defined, but equally expansive, hill tribes, and later that of Roman demographic and agricultural expansion. Attema (1993:231) suggested that the Roman colonies of Cora, Norba, and Setia may have played an important role in the later Republican 'colonisation' of the Lepine side of the Pontine plain. The presence in this area of a large number of so-called 'platform' villas which appear to be of very similar date and design argues, he wrote, for a planned process of agricultural re-organisation and exploitation, probably targeted at the production of olive oil and grain for the Roman market. The position of the colonies themselves, located on the rim of the Lepine pre-mountains with magnificent views across the Pontine plain to the sea and along the coast as far as Antium and the Monte Circeo, expresses the control exercised over this agricultural area.

HISTORIC-LITERARY REFERENCES

However, these towns and other ones existed long before the late Republican period, and in order to understand why they are located on the Lepine margin we have to trace these origins as far back as we can. The main source for information about this early period is Livy’s Ab Urbe Condita, from which we can gather the following information about each of these towns:

• *Anxur* (Terracina) - was captured and sacked by the Romans in 406 BC during precautionary campaigns against the Volscans (IV 59). Four years later its garrison was overrun again by the latter, re-taken by the Romans in 401 BC, but again under Volscan siege in 398 BC (V 8-16). In 329 BC Rome sent 300 colonists to the town, each getting 2 iugera of land (VIII,21).

• *Cora* (Cori) - a Latin town, Cora joined the Aurunci against Rome in 503 BC, but was quickly defeated by her (II 17). By 496 BC the town was under Volscan control because these were forced at that time to send 300 hostages from Cora and Pometia to Rome as pledges against attack (II 22). The territory of Cora was raided by the Privernates in 331 BC (VIII,19).

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5 Rank-size analysis (Zipf 1949) can be used to examine the degree of socio-economic integration of a settlement system by setting out the sizes and 'ranks' (based on size and ordered by rank) of all settlements in a graph. An idealised rank-size graph will have a log-normal shape; deviations from this line indicate higher (concave graphs) or lower (convex graphs) levels of integration.
• **Circeii** - in 491 BC Volscans led by an exiled Roman expelled the Roman settlers sent there in 510 BC by Tarquin (see Signia), ‘liberated’ the town and handed it over to Volscan control (II 39).

• **Anagnia (Anagni) and Ferentinum (Ferentino)** - east of the Sacco (Trerus) river, Ferentinum was taken by Rome in 412-411 BC, and given to her Hernician allies (IV 52). In 308-7 BC the Hernici of Anagnia declared war on Rome but those of Ferentinum did not. The former were quickly defeated (IX 42).

• **Norba (Norma) and Setia (Sezze)** - taking advantage of the weakened state of the Volscans following an epidemic, Rome sent out fresh settlers to Norba in 493 BC, which became a fortified point for the defense of the Pontine region (II 34). Setia was in Volscans hands (Dion. Hal. 6.61) before Rome sent a colony there in 382 BC (Vell. Paterc. 1.14). The territories of Norba and Setia were raided by the Privernates in 358 BC (VII,15), 342 BC (VII,42), and 331 BC (VIII,19).

• **Privernum (Priverno)** - Latial allies, the Privernates continued to raid the territories of neighbouring Roman colonies in 358 BC (VII,15), 342 BC (VII,42;VIII,1), and 331 BC (VIII,19). Although relatively quickly defeated by Roman armies each time, and deprived of two thirds of their territory in retaliation (VIII, 1), only the siege and capture of Privernum in 330 BC (VIII, 19-20) appears to have finally ended the conflict.

• **Signia (Segni)** - in 510 BC the Roman king Tarquin sent some surplus population out to Signia and Circeii, both to increase Roman territory and to provide points of resistance to attack ‘by land or by sea’ (I 56). This appears to have not been a very successful venture, because already in 496 BC the town had to be re-established with additional settlers (II 22). Inhabitants of the town attack fleeing Hernici after their defeat by a Roman army in 362 BC (VII,8). Still a Roman colony in 340 BC, Signia was apparently ruled by Latin allies (VIII,3).

From this brief overview it becomes apparent that no historic evidence predates the very end of the 6th century; that none of the towns mentioned was actually established by colonisation from Rome; and that most or all were therefore pre-existing Archaic and (by analogy with other areas) Iron Age settlements. Late Iron Age and Archaic hilltop settlements such as certainly existed at Signia, Circeii, Norba, and Cora were populated by a patchwork of indigenous lowland and highland tribespeople, apparently maintaining some kind of political equilibrium punctuated by low-level raiding, presumably for cattle and prestige (see also examples cited in Attema, in press). This would explain why these settlements would have been located in places which afforded both safety and control over land and cattle.

Starting with the post-Archaic, groups of Roman colonists were sent out in an opportunistic manner to safeguard Rome’s political and military interest. The towns of the Lepine margin, ‘outposts’ from the viewpoint of Rome, bore the brunt of the conflicts with the Volscan tribes which lasted throughout the 5th and the first half of the 4th century BC. More than once their allegiances swerved from safety under Roman hegemony to independence of it; in addition to this, some Latial tribes continued to raid each other’s territories, as is shown most clearly by the case of Privernum which, from its southerly position may have felt itself to be as much akin to the Volscan way of life as it was to that of the Latial League. While the objectivity of Livy’s accounts may be questioned, it seems clear that the conflict between Latins and Volscans is acted out on the medium term, the conjoncture as defined by Braudel, and can be understood perhaps in terms of the upland boom-bust cycle cited by Bintliff (1997:30-32; cf. chapter 2).

Most of the Lepine margin must have been effectively incorporated into the Roman state by the mid-4th century when, in 358 BC (VII,15) she added the Pomptine and Publilian tribes – territorial units in which citizens were enrolled for census, taxation, and military levies – and, following the final defeat of the Privernates and the settling of their territory with colonists, the Oufentine tribe in 329 BC. By the end of the 4th century the military Via Appia was completed as far as Anxur. The platform villas identified by Attema (1993) appear only after this de facto incorporation into the Roman state was completed.
VIEWSHED ANALYSIS

In view of the above, the long-term Roman ‘policy’ was not to establish colonies on the Lepine margin, but to ensure that the important central places became or remained allied to her, an allegiance that could at times be strengthened by sending out colonists for reasons as much to do with demographic pressure at Rome as with strategic interests (providing early warning and protection from Volscian raiding parties and containing a local population which could not be trusted to choose Rome’s side in a conflict). It is not unlikely that both sets of factors combined to determine which 4th-century sites were deemed to be most important.

The 4th-century BC Roman colonies of the Lepine scarp provided bases from which both agriculture and husbandry in the plain and uplands could be protected from Volscian inroads. But they also acted as visual manifestations of Roman power in the lands of her former Latial allies. Their viewsheds might therefore include areas in both the plain and the upland; especially the Lepine mountain passes from which raiding parties might arrive. At the same time they must be positioned close by valuable cropland and grazing herds to be able to protect these against sudden attack. Hence, if we model viewsheds for these colonies we must take into account upland characteristics such as the location of mountain passes as well.

Higuchi viewsheds were recently introduced in archaeological research by Wheatley and Gillings (2000) as a way of enriching traditional viewshed studies. Amongst other characteristics, Higuchi proposed...
that viewsheds should contain information about the *distance* and *bearing* to the objects in view. With respect to distance, Higuchi viewsheds are subdivided into a short range (< 360 m) sector in which objects are individually distinguishable and have a direct sensory impact, a middle range (360 – 6600m) sector which constitutes the ‘pictorial’ landscape where vision is paramount, and a long range (> 6600m) sector which contains the ‘vertical backdrop’ and horizon features. The distances at which each of these sectors begin and end are variable, because they are relative to the typical tree size for the area under study, but in the following description of Higuchi properties of the three Lepine colonies I simply use Wheatley and Gillings’ figures. Their middle range viewsheds are depicted in figure 4.

Cora is located on the western edge of the Lepini where it borders on the volcanic landscape of the Alban hills, on top of a small hill situated at the mouth of a small drainage basin (391 m asl). Its views to the north and southeast are obstructed by neighbouring higher hills. A viewshed from 2346428,4612210,400 shows that the whole of the Alban massif and the Pontine plain as far as Monte Circeo over 45 km to its south can be seen from Cora, and its direct hinterland, up to 6 km distant, is also relatively well covered. The Roman colony of Norba is situated on a promontory of the Lepine scarp, with steep slopes on three sides but open to the interior, where several small streams and their tributaries form a modest agricultural hinterland before descending into the plain at Valvisciolo. The highest point on this promontory, the ‘acropolis’ hill, is at 490 m asl. The viewshed taken from this approximate point, which is located almost 600m from the Lepine scarp (2350125,4606607,492), is especially large toward the east and south-east, and again the view across the Pontine plain includes both Monte Circeo and the Alban hills. However, from this location one cannot see the nearby footslopes and valleys of the Brivoleo stream system. As field observations have shown that long stretches of the lower Lepine slopes are visible from its perimeter wall, an improved Norba viewshed model should clearly be based on multiple viewpoints along its perimeter6. Setia is located on a small hill next to the place where the Fosso Brivolco descends into the plain, at about 280m asl (no elevations mapped within the town; over 250m above the plain), and is naturally protected on all side by steep slopes. A viewshed taken from the approximate location of its central church and a height derived from that of a neighbouring hilltop to the southeast (2358047,4595884,310) extends into the upper valley of the Brivoleo and into the pass leading east past Roccagorga, all within 5 kms of the town. There is no viewshed due east. Toward the sea, there is an almost 180 degree unrestricted view taking in the Pontine plain and coastal landscape, with the Monti Ausoni and Circeo at up to 30 kms distance as a backdrop; however, views in both directions along the Lepine scarp are restricted by the hills directly to the west and east, and the characteristic shape of the Alban massif is not visible from the town.

The most easily accessible route between the Pontine plain and other parts of Italy to the east and southeast is through the Lepini via the valleys of the Amaseno/Oufente. These valleys are surrounded by several hilltop settlements probably dating back to the Iron Age: Roccasecca dei Volsci, Maenza, Roccagorga and Priverno among them. A viewshed from Privernum (2368018,4592839,139 and 160) was used to set off the other three views. It turns out that all of the major valleys here can be seen very well from this location, even up to the pass between the Lepini and Ausoni, leading to Campania. There is no view into the Pontine plain and, possibly significantly, no significant visible upland within the Higuchi distance which the Romans might have needed to control by the installation of a colony following the siege and capture of Privernum in 330 BC.

Summing up, the colonies have an excellent view of the plain, including the both the Via Appia and the centuriated agricultural zone along it, but the viewsheds do not indicate that the lower Lepine slopes and the ancient *pedemontana* route along it were of immediate concern. Toward the hinterland the colonial viewsheds are complementary and mutually exclusive (that is, together they cover the whole of the western side of the Lepine mountains, but they do not overlap); these viewsheds, and the fields and pastures within them, are mostly within the Higuchi distance of 6600m and would therefore have afforded strong visual control over the whole area. The hypothesis that the 4th century BC Roman colonization in the Pontine region was mainly strategic in nature is therefore upheld.

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6 As was done in the case of the Roman fortress and town at Wroxeter, see chapter 16.
4 CONCLUSIONS

A general conclusion that can be drawn from the case studies presented here, is that current economic and cognitive models of the ordering of settlements and the landscape in protohistory (and, for indigenous societies, even for many centuries afterwards) are of a very non-specific and intuitive nature. Bias modeling (chapter 6) and corrective fieldwork (chapter 8) will be needed to test the many assumptions on which these models are based.

- The developed Iron Age settlement pattern in the Sibaritide and Salento Murge displays remarkable similarities in the geomorphological location and spacing of the settlements, located some 10-12 km apart in defensible hilltop positions. It must be doubted that regular access to sea-born trade had a major role to play in this, because the pattern continues into the Murge upland, and may in fact be more strictly related to control over high quality agricultural and pastoral resources. This hypothesis can be tested by targeted fieldwork in the Lepine uplands and the inland reaches of the Sibaritide.

- Current typologies of protohistoric settlements in central and southern Italy are insufficiently clear, detailed, or supported by evidence to allow the definition of hierarchical and contemporaneous levels with any degree of certainty. The basis for constructing territorial divisions, whichever method is chosen for it, is therefore lacking.

- The ‘colonial’ settlement pattern in southern Italy was centred on the coast rather than on the hill country, and combined accessibility by sea with the presence of a substantial agricultural hinterland. In contrast, Rome’s early colonies were as much or more intended to fulfill strategic functions, so their locations meet other criteria of dominance – namely that of control over routes of attack and advance. The fact that the viewsheds of the Roman colonies on the Lepine margin are both complementary and fall within the Higuchi ‘middle range’ distance creates support for the idea that these towns were located as much to control movement across the Lepine up- and highlands, as to control and protect communications and agricultural resources in the Pontine plain.

- As a tool for archaeological spatial analysis of territories, Thiessen polygons have been used extensively. The case study presented in section 2 demonstrates the weaknesses of the technique in specific archaeological situations. The use of GIS and cost surface analysis allows the technique to be refined by replacing the simple gravity model of space with one in which each centre can have its own ‘weight’ determining the relative size of its polygon, and in which characteristics influencing the accessibility of the terrain are used to determine the location of territorial boundaries instead of horizontal distance. Rank-size studies such as the one by Guidi (1985), although based on unreliable settlement sizes, when combined with X-Tent modeling techniques provide a more credible alternative to Thiessen polygons; another advantage is that they can be used to implement central place models as well as peer polity models of society.

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