

THE LANDSCAPES OF POWER: VISIBILITY, TIME AND (DIS)CONTINUITY IN CENTRAL ITALY

1. INTRODUCTION

Applying computerised methods requires more than just understanding computing; a researcher has to communicate between different archaeological fields and combine knowledge from fieldwork, earlier research and archaeological theory. In order to succeed in answering interesting archaeological questions the emphasis has to be on the interpretation of the results. In this context of archaeological communication, this article has two main aims: firstly, to discuss theoretical assumptions on which the archaeological use of GIS is based, and secondly, to use GIS in practice in order to discuss changing patterns through later Italian prehistory. The first part deals with the recent discussions on perception, visibility and the extraction of knowledge on one hand and territoriality and control on the other. The theoretical discussions are reviewed from an Italian perspective in order to integrate theory and practice.

The case studies presented are derived from my recent PhD thesis on the use of GIS in the study of central Italian settlement patterns¹. The thesis was partly based on original fieldwork at Nepi but presented also a comparative study of the territories of Nepi and Gabii (Fig. 1) in the central Italian context. These places were chosen in order to compare trajectories on both sides of the Tiber but also partly due to practical reasons, partly because of available archaeological knowledge and my conviction that further analysis of any central Italian centre will introduce new viewpoints. During my research I visited many of the key sites in Lazio and the visual impacts during these visits have partly influenced my arguments.

Visibility analysis creates atemporal results, if not based on archaeological data that show change. Interestingly, recent field research has given new evidence for settlement continuity and/or reuse of many of the main sites in central Italy. Although in most cases plateaux, hilltops and bluffs have not been settled in the same mode or location from the Neolithic to the end of the Iron Age, the changing places at the microscale give a possibility to assess local patterns. The changes can be seen as crucial in the case of Nepi and Gabii.

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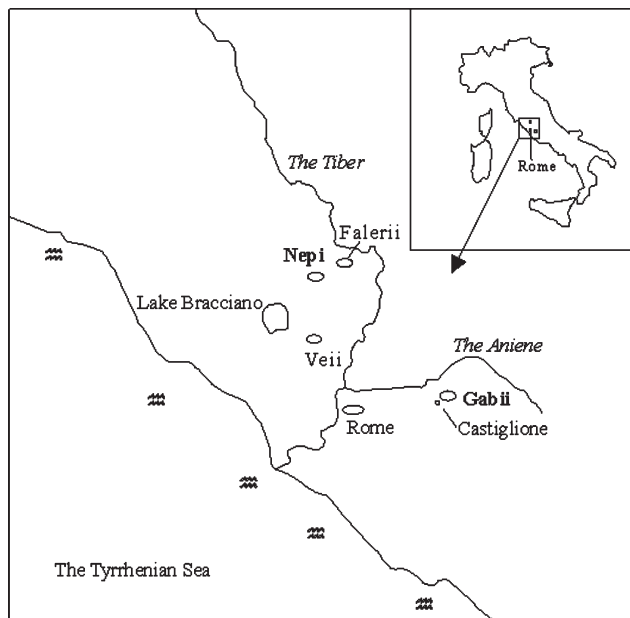


Fig. 1 – Nepi and Gabii in central Italy.

2. POWER OF SENSES: PERCEPTION, VISIBILITY AND CONTROL

Spatial definitions inside and outside a community are based on shared experiences (TUAN 1977). The collective understanding and conceptualising of sensory experiences by individual minds allow a community to create justified beliefs about the perceived through perception (AUDI 1998, 49). Therefore, following BOURDIEU (1977), we can see that physical experience and accumulation of practical knowledge create social meaning. Apart from subjective observation of the surroundings, more objective observations can be made about the physical characteristics shared by the present and past landscapes. Therefore, the world can be conceptualised by using observable homologous oppositions (high-low, above-below, open-closed etc.) that are linked with the capabilities of humans to relate observations to the measures allowed by human bodies. The existence of basic duality between visible and concealed allows the theoretical use of visibility analysis in past contexts. The relationship with human capabilities allows the assumption that visible entities had different meaning from the concealed ones.

The ecological and cognitive needs were both involved in the way past communities perceived their environment. In that sense, perception is related to human ecology and to natural, human and social relations (GIBSON

1979, 127; INGOLD 1986, 6). Information perceived presents *affordances* to observers (GIBSON 1950; 1966; 1979; WHEATLEY, GILLINGS 2000). How the choices on possible affordances are made depend on cultural background, social norms and relations inside the community. Thus, the relationship between the environment perceived and the perceiver is qualitative and cognitive. A landscape is a setting that is constructed as a result of a selection process (INGOLD 1986, 6; 1993, 162).

Power can be related with visual perception and affordances using FOUCAULT's (1980) concept of *gaze*. Looking and seeing are the easiest forms of surveillance and inspection. In them power is exercised continuously with a minimum cost. Power and gaze are also related with knowledge since authority is sustained by a regime of knowledge. Those who keep power also administer "truth" and have a stronger position in power discourse.

The importance of the visual senses in studying power and control in central Italy is based on the evaluation of the Greek idea of the boundaries of a *polis*. Aristotle suggested that the importance of a town extended [only] as far as the eye could see (Aristo. *Pol.*, 7.5.4.). This correlation between what was controlled and what was seen has been suggested by M. RENDELI (1993, 20-21). In his critique of the Thiessen polygons, he argued that the influence may have been limited to an area visible from the centre and from where the centre itself could be seen.

Most criticisms of visibility studies have been directed towards the prioritisation of vision (e.g. THOMAS 1992; JONES 1998; WHEATLEY, GILLINGS 2000, 13). Importance of vision and appreciation of vistas are seen as western, value-laden assumptions, views not necessary shared by past people. In the Greek-Roman philosophy the visual perception was valued over the other sensory experiences (Cic. *nat. deo.*, 2.41.140). Therefore, we can argue that vision had preferred status in central Italy during most of the first millennium BC. That the same can be projected to the more remote past, is not clear.

3. THE IMPORTANCE OF A PLACE

A difference between *place* and *space* is formulated via experiences and perception of physical world. Places are more static points of temporal stays while space creates the background, the immense surrounding world. Place are defined by stopping or dwelling "here", whereas space is experience through movement "there" (TUAN 1977, 12; THOMAS 1996, 31). Living in a place creates a sense of locality. This feeling is enhanced by knowledge of familiar spaces where community members pass frequently and that provide subsistence and the existence of other, farther places. The areas of everyday tasks can be described as "tasksapes" (INGOLD 1993, 157) that form the land-

scape of familiar routines. Both place and taskscape were part of community's territory. Human *territoriality*, action inside a defined space, is a biological quality but defined by geographical realities and culture (SACK 1986).

Territoriality conceptualises the communal sense of rights to resources in a certain area (SACK 1986, 5). Classifications such as “ours”, “theirs” or “nobody’s” give linguistic expression to perceived ownership. If the concept of private land ownership does not exist, people have a sense of a right of being in their area. Communication between individuals is essential in defining territories and boundaries. Boundaries are a mental construct but they can be fixed and defined by artificial markers or topographical features (*ibid.*, 34). To keep boundaries intact requires a capability to have control over an area. The physical marks of control over access and use of resources are visible proofs of power and create mental boundaries to define the areas where it is free to move.

Territory as an agreed entity is based on communications and control, so it is prone to change through time. Methodologically, this is a problem, because boundaries can exist without leaving any material signs. Archaeologically, boundaries have been defined artificially using Thiessen polygons (e.g. BINTLIFF 1994) but in reality natural boundaries have to be taken into account (e.g. DI GENNARO 1982). Site catchments (VITA-FINZI, HIGGS 1970; BINTLIFF 1977) model exploitation territories but those are likely to have been different from perceived and cognitive territories (BUTZER 1982, 252-257). In the past, communities were involved in “social spatialisation” and constructed collective mythical, imaginary categorisations (SHIELDS 1991, 31; YOUNG, SIMMONDS 1999, 204-205; see also RIVA, STODDART 1996).

The archaeological evaluation of significant past markers is often based on “natural” choices (e.g. DI GENNARO 1982) and their possible association with archaeological structures (e.g. RIVA, STODDART 1996). Alternatively, according to the phenomenological approach, the universality of perceiving allows the researcher to make the choice based on his/hers own perception (TILLEY 1994; BRÜCK 1998). Often, the lack of archaeological proof is the major problem. Territories were historically constituted and a scrutinised analysis of mechanics and structures of perception (JONES 1998) or homologous oppositions (BOURDIEU 1977) can only suggest measurable and observable possibilities. However, an analytical review of basic dualities between constructed and natural spheres of a landscape is a start.

In summary, combining the ideas on senses, power and place, one can assume that the area visible from an archaeological site has included a series of meaningful entities. The visible area may not be related to specific territorial boundaries but visible/non-visible duality creates a natural boundary in the landscape. If nothing else, visible area could include all affordances that a community was able to guard directly.

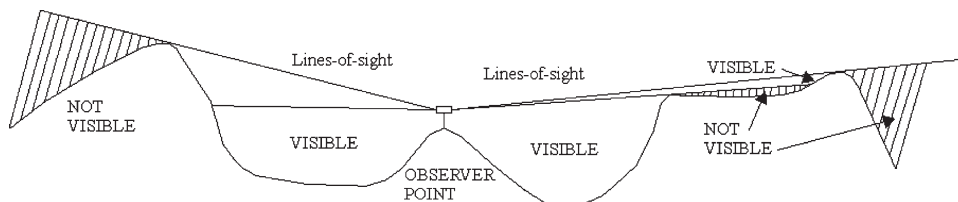


Fig. 2 – The principle of the line-of-sight.

4. VISIBILITY ANALYSIS AND GIS

“Dominant position” and “good views” were difficult to measure before GIS algorithms and packages. The principle behind visibility analysis is a simple one: the extents of an area visible from one point or a set of points are defined over a digital elevation model. The resulting grid presents the cells where a straight unhindered line-of-sight (LOS) exists between observation and target points (Fig. 2). The heights of observation points, target points and cells between them determine if a cell can be seen from the point. Cells are considered “visible” if no elevation between is higher than either observation or target points.

A visibility grid presents the maximum area that can be seen from a point or set of points. Since the four elements of perception are the perceiver, the object, the sensory experience and the relation between the object and subject (AUDI 1998, 15), visibility analysis allows us to make direct assumptions on the first two. In order to assess the third, a series of issues related to the “correctness” of the resulting grid have to be considered (WHEATLEY, GILLINGS 2000).

Theoretical problems like atemporality and prioritisation of vision are obvious, but the methodological problems are also well-known. Firstly, different algorithms, and therefore most commercial packages, give slightly different results (FISHER 1993); however, none of resulting grids can be definitely said to be wrong. Secondly, past vegetation and weather conditions defined the possibilities of perception (WHEATLEY, GILLINGS 2000; TSCHAN *et al.* 2000), not to mention the ability of the observer to see. These can be taken into account in more complex modelling. However, the past relations between the object and subject together with the past values can only be hypothesised on the basis of the theories discussed above.

5. CONTINUITY AND DISCONTINUITY DURING LATER ITALIAN PREHISTORY

Before discussing the visibility analyses, the main theories on settlement continuity and changing patterns have to be discussed briefly. In the long-term the number and assemblage of sites tend to change from one

period to another. The consensus is that before the Appennine Middle Bronze Age the sites tended to be relatively temporary and lived in by a family or small group. The concentration of settlement into larger conglomerates settled by groups of families in geographically defined, naturally defended sites may have started during the Middle Bronze Age and intensified towards the end of the Bronze Age (e.g. DI GENNARO, PASSONI 1998). Due to a crisis, the settlement pattern changed by the Early Iron Age and during the 9th century BC only the largest proto-cities were settled (DI GENNARO 1986; DI GENNARO, GUIDI 2000; NEGRONI CATACCHIO 2000). The minor centres would have been resettled during and after 8th century BC (IAIA, MANDOLESI 1993).

Empirically, Middle Bronze Age settlements have been associated with different kinds of locations whereas Final Bronze Age settlements have been characterised by hilltop or promontory locations (e.g. PACCIARELLI 1979; DI GENNARO 1988). The plateaux of some of the largest Etruscan sites, e.g. Tarquinia and Vulci, seem to have been settled continuously, not only between the 9th and 8th centuries but also from the Final Bronze Age to the Early Iron Age (PACCIARELLI 2000). Furthermore, there are a series of finds from the Neolithic to the Early Bronze Age from Tarquinia. Early prehistoric finds have been also found from places like Musarna (RECCHIA, BOCCUCCIA 1998) and Rome (ANZIDEI, GIOIA 1995; 2000). However, there are also local dislocations of settlement. For example, settlement moved from Isola Farnese to Veii during the 9th century BC (BARTOLONI *et al.* 2001).

6. TWO PLACES, TWO CASE STUDIES

6.1 *Observing Nepi*

Nepi lies circa 45 kilometres north-west from Rome in a highly dissected landscape where deep river valleys and wide plateaux alternate. Nepi (ancient Nepes) seem to have had a rural character during the Archaic period. The smaller settlements were located farther away near the boundaries of hypothetical territory. This phenomenon suggests that inhabitants were directly involved in agriculture and the social structure was not fully urbanised. In the past, Nepi as a place did not exist during the Neolithic or Early Bronze Age. There were sites nearby but they were on the plains or near minor river valleys.

Il Pizzo, a smaller promontory south of Nepi, was settled during the Middle Bronze Age (DI GENNARO 1992; DI GENNARO *et al.* 2002; RAJALA 2002). The situation during the 9th century BC is unclear (DI GENNARO *et al.* 2002; RAJALA, in press), but Nepi itself became settled during the 8th century BC (IAIA, MANDOLESI 1993; DI GENNARO *et al.* 2002). Like in Veii the settlement

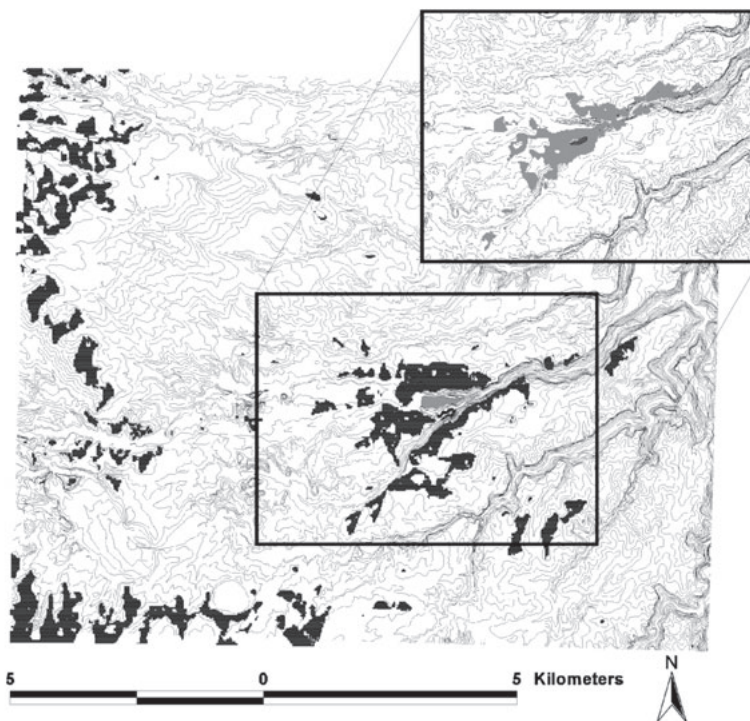


Fig. 3 – The visibility from Il Pizzo (inset) and Nepi (main image).

was relocated but if the change was following a settlement hiatus will be seen only after further fieldwork.

In the analysis, the target grid was defined by four *Carta Tecnica Regionale* map sheets. The data set was created by interpolating digitised contours with Topogrid algorithm in ArcInfo. The resolution of the grid was 25 metres and the offset of 1.5 metres was used to simulate the view point of an adult. No vegetation cover was used; therefore, the area is the maximum visible area in the surroundings. ArcInfo was used in the Unix environment but the final images were compiled in ArcView for desktop use.

The visible area around Il Pizzo is relatively small and is dominated by the river valley (Fig. 3). The conclusion is that the river is central in the visible area, whereas the plains around are concealed. The site has a dominant position in relation with the core of the visible area but not in relation with the plains. The interpretation is that the site can be seen as a point from where people guarded their assets along the river. When one compares the area visible to the area needed for grain production during the

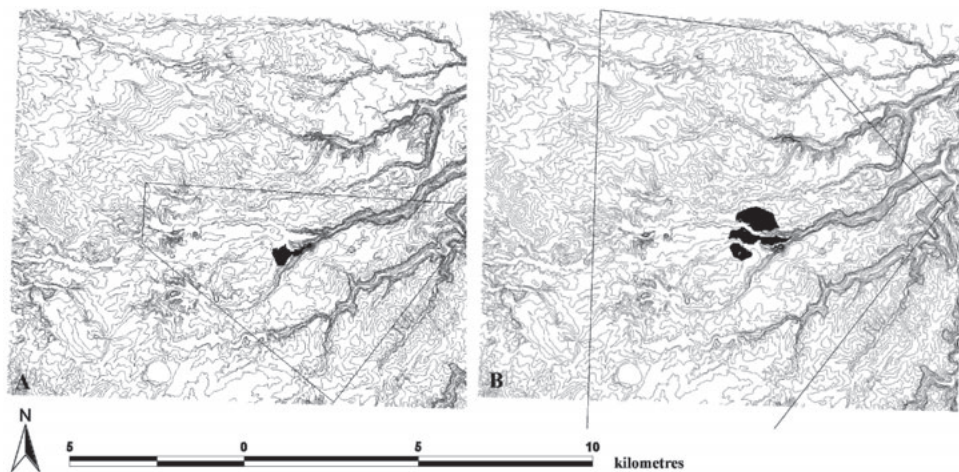


Fig. 4 – The area needed in grain production. A. Il Pizzo. B. Nepi.

Final Bronze Age (Fig. 4), it becomes clear that all means of subsistence (water, foraging, fishing, agriculture) could be controlled together with pathways along and across the river. The importance of riverscape is enhanced by the fact that Monte Soratte, the regional landmark, cannot be seen from the site (Fig. 5). The importance of rivers, fed by perennial springs in the area (BONI *et al.* 1988), is suggested also by the recreation of similar visibility grid from Torre dell’Isola, another local Final Bronze Age site (DI GENNARO *et al.* 2002).

The relocation changed the controllable area (Fig. 3) but some of the elements remained. The riverscape was still central but the visible area included large areas on the plains. Furthermore, the earlier site of Il Pizzo, now in funerary use (RAJALA 2002), was under gaze with a possibility to have a visible link with the ancestors. The visible area covers again the area needed for grain production (Fig. 4) and includes all major river crossings, and therefore shows how economic assets were under control. The change is underlined by the way Monte Soratte became visible (Fig. 5), and as with the site of Civita Castellana², can be seen as the central landmark. Furthermore, the maximum visibility created an intervisibility with a series of Early Iron Age sites. Even with vegetation, settlements at La Ferriera and Casale Filissano, could have been seen on clear days from a viewing post. Since the two sites can be supposed to be minor boundary sites, the changes in visibility relates Nepi to a regional pattern and Monte Soratte perhaps to a regional identity.

² The residential part of *Falerii Veteres* at least from the Orientalising onwards.

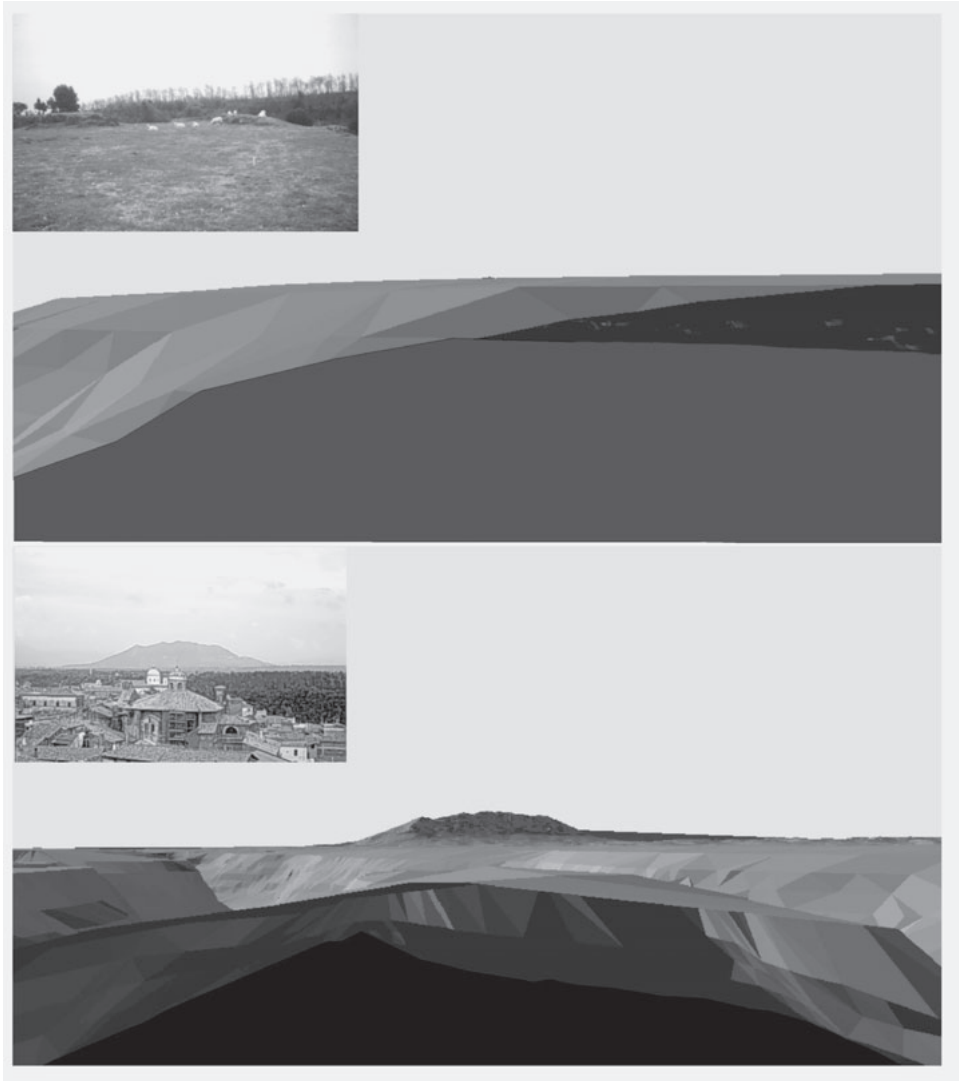


Fig. 5 – Monte Soratte. Upper view: from Il Pizzo. Lower view: from Nepi.

6.2 Observing Gabii

The ancient town of Gabii was located on the volcanic crater by the lake Castiglione east of Rome. The existence of rural settlements in the vicinity of the town (QUILICI 1974) shows that the relationship between rural and urban was different from that in Nepi; rural population was urbanised, ei-

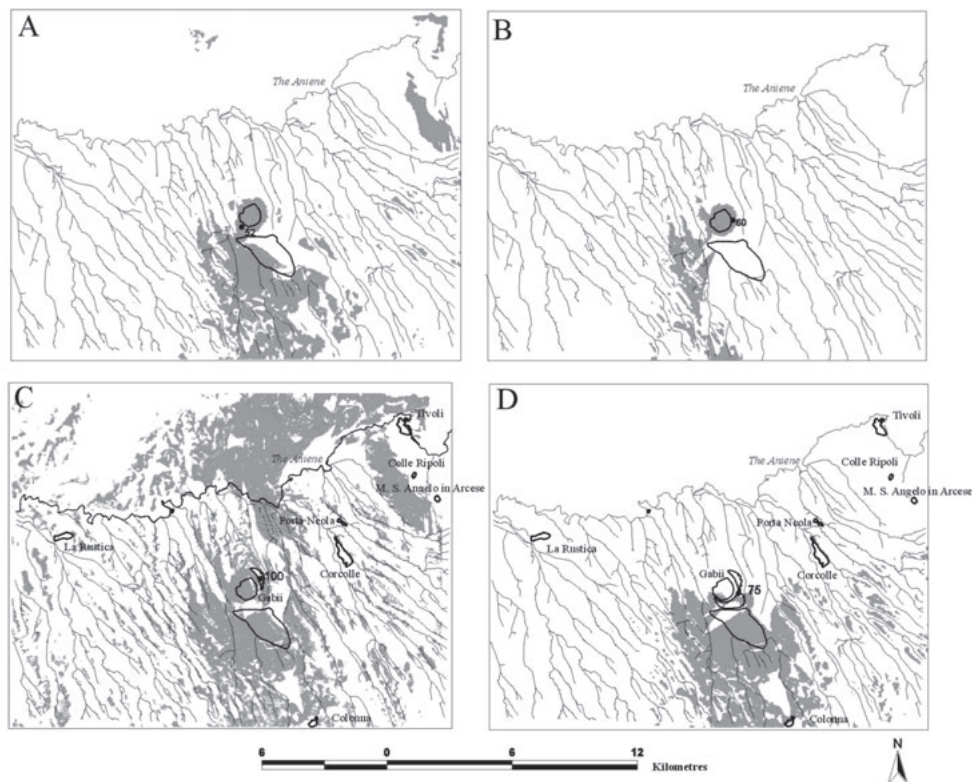


Fig. 6 – Visible areas. A. Neolithic Casale del Pescatore. B. Middle Bronze Age Castiglione. C. Final Bronze Age Torre Castiglione. D. From lower Archaic town.

ther owning properties elsewhere or involved in occupations inside the town. By the Archaic period Gabii was at the higher level of qualitative settlement hierarchy. Unlike in Nepi the history of a place can be traced further back, although not in relation with constant location.

During the Neolithic, the settlement of Casale del Pescatore lay south of the lake Castiglione (CARBONI 1993) whereas during the Middle and Recent Bronze Age the known settlement was located east of the lake in the crater itself (GUAITOLI 1981; BIETTI SESTIERI 1984; DE SANTIS 2001; Fig. 6). During the Final Bronze Age, it is assumed that the highest hilltop was settled, although the destruction of the site in quarrying hinders the verification of this assumption (GUAITOLI 1981). By the Early Iron Age the southeastern rim of the crater was settled and later during the Orientalising and Archaic periods, the eastern and southern parts of the crater rim were the location of the ancient town. Like in Nepi there are a series of relocations, but also clear

hiatus between the Neolithic and Middle Bronze Age. The continuity is related to an area, not a place. However, everything suggests that the settlement expanded organically, like in Tarquinia, from the Final Bronze Age hill-top site to the conjoined bluff.

The elevation data for the Gabii area came from *Istituto Geografico Militare* (I.G.M.)³. The case study area falls to the areas of I.G.M. 1:25,000 map sheets of 150 I SO Colonna, 150 IV SE Tor Sapienza, 150 I NO Tivoli and 150 IV NE Settecamini. The original raster tiles had a resolution of 20 metres and the aspect coverage showed signs of padding and tiger striping, artefacts signalling the use of unsuitable interpolation algorithm (WOOD, FISHER 1993; BURROUGH, McDONNELL 1998, 127-126). The quality of the data set was enhanced by smoothing DEM with a 3×3 filter (BROWN, BARA 1994; WISE 1998). Naturally, the elevation values were slightly altered in the process but the execution of FILTER command in ArcInfo with four iterations of a 3×3 low pass filter removed visible artefacts. All visibility analyses were executed using the highest spot height of the site as the observation point.

When the location of Casale del Pescatore is considered, the existence of lake/marshland in the crater of the lake Castiglione and another lake/marshland in the south (SEGRE 1992) has to be taken into account. In summary, during the Neolithic, both lake and marshland areas may have been seen together with a considerably large area of dry land in the south-west (Fig. 6). During the Middle and Recent Bronze Age, the area of potential perception was reduced and the lake of Castiglione was the focal point (Fig. 6). The interpretation of the situation during the Final Bronze Age is based on the analogy between the potential location and the typical locations of Final Bronze Age sites. It is assumed that the society was changing towards a more complex one with a level of tension at the regional scale (DI GENNARO 1986; BIETTI SESTIERI 1992). This means that wide visibility could have affected the choice of the location in the context of consolidating power. The expansion to the less dominant area in the south from the Iron Age onwards made the marshy area in the south (Fig. 6) and the Alban hills behind them more focal in everyday life. Furthermore, expanding community and expanding settlement created fragmented views.

As in the case of Il Pizzo and Nepi, it is easy to see how subsistence economy was secured with control over key areas. During the Neolithic, the guarding gaze could look over mixed resources. The importance of aquatic resources during the Middle Bronze Age is suggested by bone material from the excavations (BIETTI SESTIERI, DE SANTIS 2000). Most changes in settlement patterns seem to occur earlier at Gabii than at Nepi (Figs. 6-7). The opening

³ Data have a reproduction authorisation n. 4706.

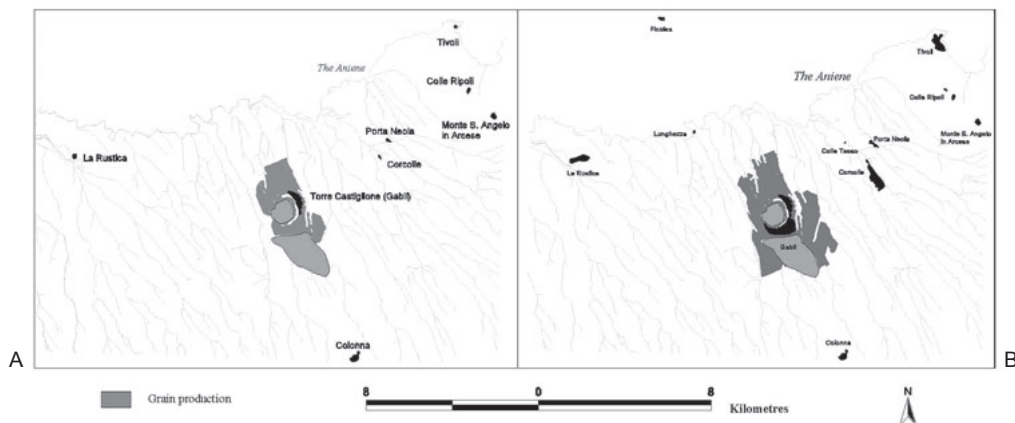


Fig. 7 – Grain production (with fallow) needed to support the population. A. During the Final Bronze Age. B. During the Early Iron Age (with fallow).

of horizons, visible during the Early Iron Age at Nepi, can be dated to the Final Bronze Age at Gabii. The visible area from the hilltop of Torre Castiglione covers areas needed for grain production both during the Final Bronze Age and Early Iron Age. Furthermore, in optimum conditions Gabii was intervisible with the sites of Colonna, Tivoli and Monte S. Angelo in Arcese. All these sites were in use both during the Final Bronze Age and Early Iron Age. The changes point to the need to see; this could be interpreted both as a sign of interdependence or tension. Knowing the Latin history, probably the latter.

7. CONCLUSIONS

It is hoped that the examples presented in this article show both the usefulness of simple GIS modelling and the need for the integration of theory, method and empirical data. This kind of integration is possible only by improving communication between different fields of archaeology. The dating of different phases is only possible with increasing knowledge of pottery types and settlement finds. Therefore, both pottery typologies and continuous field-work are needed. Chronological differentiation is not possible otherwise. Theoretical considerations are needed in order to interpret the possible meanings of grids produced by different analyses. Methodologically, GIS allows visualising and modelling characteristics that were almost impossible to calculate using old-fashioned cartography – at least with such ease.

One has to acknowledge that the interpretation of GIS images is impossible without assumptions drawn from prevailing theories and the research process leading to explanation has to be reviewed critically. For example, the location of a Final Bronze Age settlement at Gabii is assumed because of the

inductive conclusion that a hilltop is the typical location for a Final Bronze Age settlement. A dominant location is chosen because all analogical sites are in such places. However, the linked assumption of increasing hierarchy during the Final Bronze Age is used to interpret the meaning of a wide visible area. Without these kinds of assumptions, one could not draw conclusions from the results of GIS analyses, no matter how interdependent the assumption and the explanation are.

In summary, time dimension is only introduced to GIS analyses via archaeological fieldwork and research. Analysing situations in time slices may not be dynamic but it allows characterising changes between different periods. Observations of change can then be used in explaining, in this case, the relationship between place and space by suggesting increasing need for control and rise of regional interaction. Furthermore, the results allow suggesting different local trajectories during the Final Bronze Age. Inner Etruria and Faliscan area seem to have had different rate of change from neighbouring areas. Everything points to regionality at a local level in central Italy.

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ABSTRACT

Interpreting the results of computerised methods in archaeology cannot be done without a reference to theoretical archaeology. The main aim of this paper is to discuss the theoretical assumptions behind the use of GIS and visibility analysis in modelling controlled territories. An underlying assumption is that changing locations of settlements are related to changing needs of communities in their environment. The relationship between visible areas and those needed for subsistence is reviewed in a specific context. The case studies presented are those of Nepi and Gabii. The different position these sites had in central Italian settlement hierarchies is discussed in relation with the interwoven relationship between assumptions on and interpretations of the results of visibility analyses.