

UNDERSTANDING THE PROTOHISTORICAL TERRITORIAL HERITAGE BY MEANS OF IRON AGE SETTLEMENT SYSTEM ANALYSIS IN GIS: A CASE STUDY IN THE EASTERN LANGUEDOC (FRANCE)

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ABSTRACT

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We often tackle the territorial problem only with a regressive analysis. However this reasoning tends to enhance the status of settlements still seen nowadays as villages or towns. Otherwise, we think that protohistoric agglomerations were much less significant if they were deserted during gallo-roman period. That's why our reasoning is influenced by our visible cultural heritage. Yet a spatial approach about the dynamic of settlement systems during the Iron Age underlined a non-linear development with relative "recession" and "expansion" periods for each agglomeration. Starting with the fifth century BC, these compete in establishing their (extractive) settlement networks, and in developing their land use. We can observe in a relatively detailed way the intensification of this competition in the form of symbolic expressions of the networks' growth through the visibility control, the increasingly massive fortifications and the increasingly high towers. Extern stimuli, as the Mediterranean exchanges or the roman colonisation for example, seem to accentuate this competition and contribute to develop some agglomerations or to pressurize others. We propose an analysis model which cross both reasonings, regressive and spatial that would give a better understanding of the evolution of territorial patterns during Iron Age and what it brought in our territorial heritage.

INTRODUCTION

In classical archaeology, the study of proto-historical territories is often approached by means of regressive analysis. This type of analysis is based on the assumption that "the memory of societies takes care of the transmission of the inherited data, making it possible to go back as far as the first settlements" (Leveau 2002:9). This principle can be questioned as it tends to emphasize the status of settlements still seen nowadays as villages or towns, and deserted agglomerations are considered to be less significant. This type of analysis is highly influenced by the visible cultural heritage. However, even though the Greek and Latin sources written during and after the Roman conquest can tell us something about the situation of the pre-Roman peoples, it is also true that they can deform reality or erase some aspects of pre-Roman territorial dynamics. For this reason, we must apply a constructive and systematic approach to studying these territories by using archaeological evidence that can shed new light on the processes of territorial evolution. By combining data sources, I may be shown how the protohistorical territorial pattern has contributed to our own territorial heritage. After a presentation of the geographical and historical context, the spatial models and the methodology applied, an applied example is given from the Nîmes region in the south of France. Using this case study as an example, this paper will focus on specific aspects of the results to emphasize how a different methodological approach can influence our overall perception of the protohistorical territorial system.

THE VOLCAE ARECOMICI AREA AND ITS "CAPITAL": NÎMES

The data set used in this case study is from the Languedoc area in the south of France, more precisely between the two towns of Nîmes and Montpellier (see Fig.1). According to

ancient sources (Christol and Goudineau 1987-1988), it was occupied by the pre-Roman people of the Volcae Arecomici, whose capital was located in Nîmes. The territorial system controlled by Nîmes, however, is an important topic of discussion. It seems that during the protohistorical period (6th c. BC - 1st c. BC), the status of Nîmes was not yet clearly outlined. The assumption of the central role of Nîmes rests on the interpretation of texts handed down from the second Iron Age¹, as well as archaeological evidence which has proven to be rather weak. Furthermore, these data seem to indicate that Nîmes did not have the same status throughout the protohistorical period; rather, it was the object of progressive construction. Under these conditions, it is necessary to situate the evolution of this community within the more general process of a regional settlement pattern, in order to verify if Nîmes actually played a dominant role and controlled a broad territory from its beginnings. If not, it is a matter of identifying the factors of its success in relation to other agglomerations like hillforts in the region. Unfortunately, there is no exhaustive archaeological information available on the entire Volcae Arecomici area. It is accepted that it could have covered the Eastern zone of the Hérault department and the whole of the Gard department with some extensions into Lozère and Ardèche (Fiches 2002:119). But for practical reasons I have decided to study only the area around Nîmes which covers nearly 900 km². The settlement analysis carried out is based on the hypothesis that each settlement should not be studied in isolation in order to define its territorial influence. Instead, every settlement interacts with its neighbours, forming part of a dynamic system controlled by a centre. We can only understand the geographical position of each settlement, its hierarchical status and its capacity to last, that is to say, to actively intervene in the territorial development, when it is studied together with the other settlements surrounding it. Taking this into account, the analysis

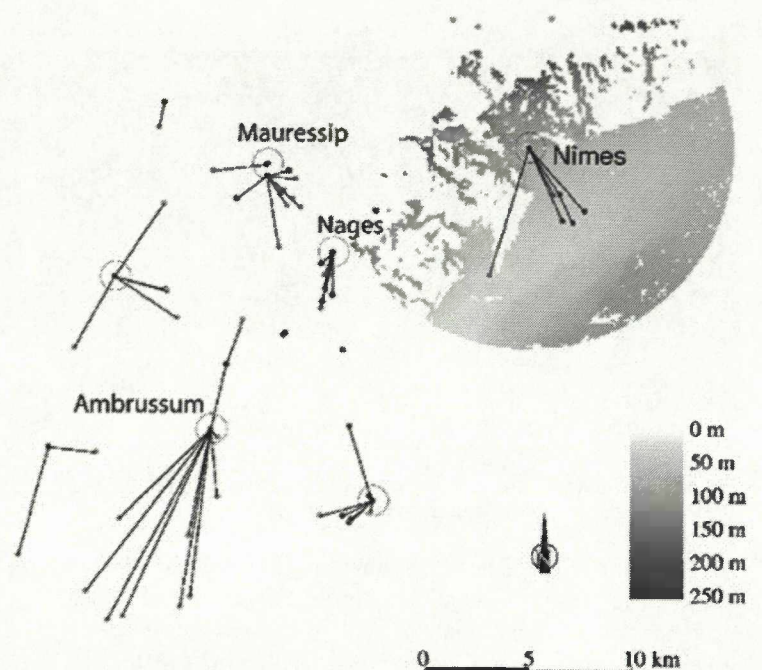
aims at emphasizing the links, which the various habitats could maintain between them and with the space exploited. In this way we can try to rebuild the local settlement networks, which correspond to the territorial influence of a rural community. On a different scale, it is a question of finding clues for the connections between the various centres of these rural communities. It is believed that in this way we can better understand the territorial organisation of the Volcae Arecomici people as well as the real role of Nîmes in it.

ANALYSIS

We present briefly the global methodology which is more detailed on the CD. First I tried to devise a classification system for the archaeological settlements in order to rank them in a hierarchical typology. With this intention, each settlement was described in a systematic and homogeneous way, using a set of variables that was elaborated and tested within the framework of the Archaeomedes Programme (van der Leeuw 1995, Durand-Dastès et al. 1998, Favory et al. 1999). The most relevant variables—especially surface area, the nature of building materials, and the symbolic status—were processed by means of factorial correspondence analysis, followed by an ascending hierarchical classification (Sanders 1989, Nuninger 2002a:100-129). These statistical analyses made it possible to distinguish seven classes of settlements: starting from the most modest ones, such as temporary constructions, shelters or farm annexes, toward the most significant settlements, such as the agglomerations which constitute the major centres of settlement (Nuninger 2002a:117-125). The projection of the settlements on the first axis of the factorial analysis, which is strongly structuring from the point of view of hierarchisation, enables me to rank all the settlements. In this way I can locate and evaluate the hierarchical weight $H(i)$ of each one on a relative scale.

In order to define the links between the various settlements, I applied a gravity model already experimented with in the formalization of the networks of Gallo-Roman settlements (Durand-Dastès et al. 1998:203-217). This model allows us to attach each settlement to a central place according to distance and offers the possibility to construct theoretical settlement networks, per century (Pumain and St Julien 2001:184).

We integrated to this basic model a cost surface of movement by foot as a function of the topography. This weighted distance between each settlement and its contemporaries was calculated with GIS. The gravity model was then calibrated: on the one hand, according to a critical distance at 10 km (because on average this corresponds to the distance of the nearest neighbour between centres); on the other hand according to the visual from the centres, with the assumption that each settlement connected to a centre must be able to be controlled by that centre (Nuninger 2002a:137-149) (see Fig.1).



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Figure 1 Visibility and calibration of the networks model: the example of Nîmes during the 2nd C. BC

In order to generate "territorial maps" from the information generated by the settlement network analysis I used the 'off-site' finds. These are scattered sherds that are generally rather fragmented with blunted edges due to repeated agricultural activities. These scattered sherds are interpreted to be the result of spreading by domestic manuring. Their spatial distribution can therefore allow us to evaluate the cultivated area by protohistorical communities. By reason of the imprecise chronology, I developed a chronological model based on the outcome of all the settlement excavations in the studied area. Then, I developed a spatial modelling integrating distance from settlement using ethnological references. The entities selected and defined according to the model can constitute the theoretical community lands² or catchment area (the agricultural territory exploited by a rural community) of the communities whose evolution we can follow by century (see Fig.2).

Lastly, in an attempt to understand the basis of occupation of each community, I worked out a final variable, which corresponds to the visual competition between contemporary centres. This layer is simply obtained by a boolean overlay of zones with visual control over each centre.

The confrontation between these various archaeological or derived findings within a dynamic analysis of the settlement in the region then enabled me to shed new light on the problem of protohistorical territories, supplementing the classical regressive reasoning.

TOWARDS NEW OBSERVATIONS OF PROTOHISTORICAL TERRITORIAL DYNAMICS IN THE AREA OF NÎMES

To illustrate this, I present an example from the Nîmes area, a case study centred around three hillforts situated in the

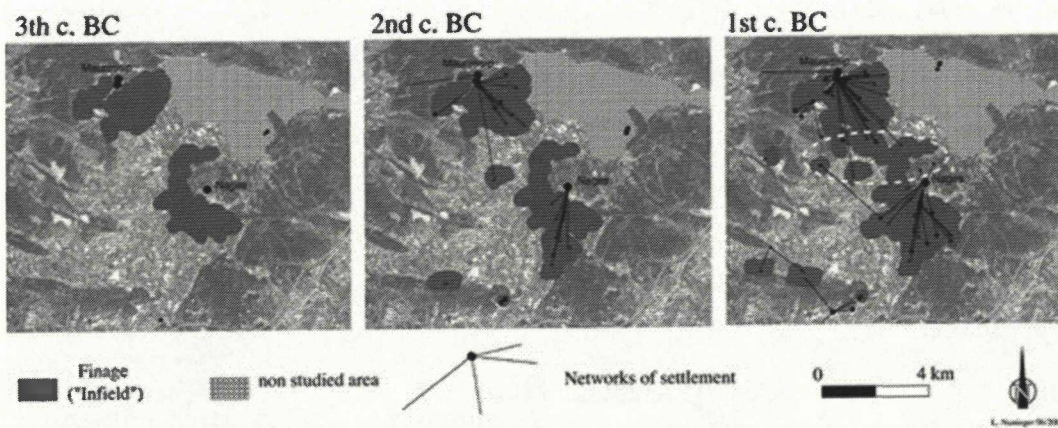


Figure 2 Networks of settlement and theoretical community lands or catchment areas in the Vaunage region (Gard department, France)

micro-region of the Vaunage: MaureSSIP, Roques de Viou and Nages. The Volcae Arecomici occupied this area during the protohistorical period, and the goal of the analysis was to understand how the territory of this people was organized. Besides, we were interested in knowing when the hillfort of Nîmes started to play the role of capital, or at least, of central place.

The first settlements of the highest hierarchical level, Nîmes and MaureSSIP, were created in the region at the end of the 6th or the beginning of the 5th c. BC. Both agglomerations seem to show that their influence is similar, at least until the beginning of the 2nd c. BC. In this period, no centre seems to have clearly dominated the others and we could envisage a mosaic of communities whose emergent centres have full control of their territory. Even if we consider a system of alliances between these communities in the form of a confederation, it is highly probable that this has been sufficiently flexible to ensure a relationship that, if not conflictual, was at least competitive. This impression is reinforced by the evolution of ostentatious and prestigious constructions. They follow one another and continue to increase in qualitative and quantitative terms between the fourth and the 1st c. BC, with the construction of more massive fortifications and higher and higher towers on each regional hillfort (Nuninger 2002b). Moreover, a spatial anomaly in the generally regular settlement pattern, found around the hillfort MaureSSIP, attracts the attention and raises a number of questions about this competitive spatial control.

Until the beginning of the 4th c. BC, the hillfort of MaureSSIP was undoubtedly the only nucleated settlement within the Vaunage micro-region. Its strategic position, on a butte, enabled it to visually control all of the inlier.³ In addition, it controls all the entrances to the

inlier to the south, the northwest and to the northeast towards Nîmes. However, from 375 BC, the situation changes due to a new habitat, Roque de Viou that takes residence on a hill which faces the MaureSSIP mound. The ostentatious/prestigious character of the surrounding elevated wall facing MaureSSIP⁴, and the vast surface area enclosing Roque

de Viou, makes it implausible that this settlement was established without a conflict with the MaureSSIP community or without its tacit agreement obtained by external support of the newly installed community. Thus, the development of this site could signify a territorial dispute between these communities of the Vaunage and may be indirectly linked with Nîmes. At the end of the 4th c. BC, the community of Roque de Viou moved a few hundred meters to the neighbouring hill in Nages without any archaeological explanation: the site was not destroyed, and it happened rather rapidly. Even though that in itself does not constitute an explanation, it should be stressed that the settlement was relocated from a place within a zone of visual control of the hillfort of MaureSSIP to a protected site. The hill which dominates the present village of Nages, is oriented toward the south, at the foot of the spur of Roque de Viou, and is not visible from MaureSSIP. When we cross the various zones of visibility from each of these hillforts, we can see that the zone of visibility of Roque de Viou makes contact with almost all the space controlled by MaureSSIP (see Fig.3), whereas the visual influence of Nages covers only on half of the zone seen from MaureSSIP (see Fig.3).

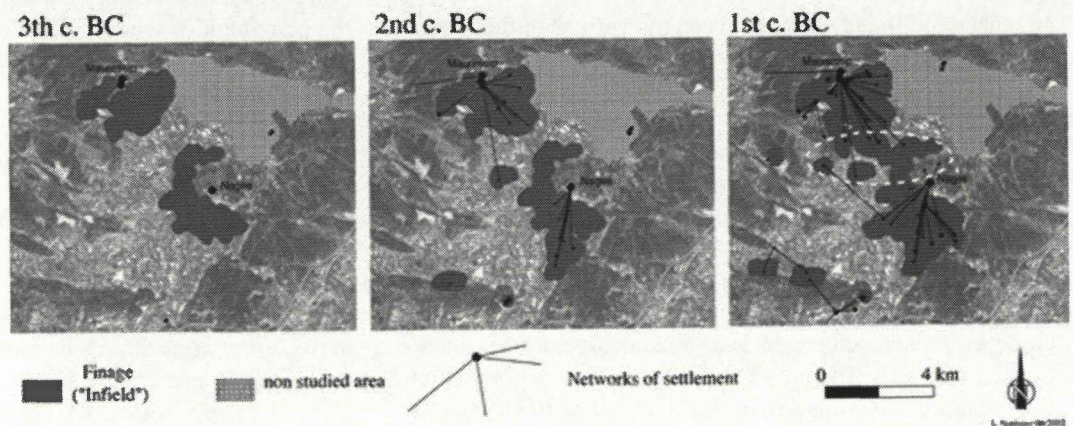


Figure 3 Visibility from the hillforts of MaureSSIP, Roque de Viou and Nages

The chronological succession of these settlements then enables us to suggest the following hypothesis: the site development of the Roque de Viou community, during the 4th c. BC, could have become a threat, a rival in the face of MaureSSIP,

whoscreation in the fifth century BC would ensure a certainly older and better anchored control of the land. In addition, from the end of the 5th and 4th c. BC, we can observe the distribution of agricultural spread indices. This points to the extension of the cultivated space and a decrease of the amount of new land available for agricultural activities. This phenomenon could have led to a relatively equal division of the zones of influence of the two communities of MaureSSIP and Roque de Viou/Nages, especially from the 3rd c. BC onwards.

The absence of violent destruction in the agglomeration of Roque de Viou could indicate the existence of a relatively peaceful agreement with the community of MaureSSIP, but highly unfavourable for Roque de Viou. Because of this, the community of Roque de Viou then sees itself obliged to invest in the construction of a new agglomeration and probably in the development of new land for the construction of their territory. This interpretation of the event would mean that MaureSSIP is still able to oppose a strong force of other communities to preserve its territorial base. Even so, it appears to be weakened by the division of the zones of influences in Vaunage. Consequently, if we accept this hypothesis, the example of MaureSSIP - Roque de Viou/Nages, implies the existence of politico-economic relations between the communities, which one can attribute to the tribes. A question remains, however, concerning this type of territorial conflict: could it be settled between the two communities? Did it presuppose the intervention of an external body, in the form of an "inter-tribal council" or of a "dominant leadership"?

The state of the archaeological knowledge unfortunately does not permit us to resolve this question, but it does point to a rather limited regional political organization. Under these conditions, we can ask ourselves which agglomerations in this area could profit from such a situation. Of course, we think of Nîmes, which in the same period keeps all the necessary space to develop itself. Then, it's interesting to follow the extension of each centre in the settlement networks and cultivated areas. In the beginning of the 2nd and especially in the 1st c. BC, competition between the centres seems to have reached its climax, and while certain communities mutually contribute to their own suffocation, others are able to continue their development. From the 2nd c. BC, one can observe the creation of small sites, classified as farm annexes or small habitats. They don't last for very long, but they are found within the settlement networks of the centres present in the 3rd c. BC. This diffusion of small settlements can be interpreted as the expansion of the centres. All in all, each centre appears to be able to control the space needed for their expansion. Only those of MaureSSIP and Nages have seen their progression rapidly limited by one another, all the more so because they are the most "productive" centres as far as the small sites are concerned. Moreover, for these two communities, it is necessary to emphasize the extent of their cultivated area which ends up meeting some time in the 1st c. BC, pointing out new signs of possible conflicts (see Fig.2).

CONCLUSION

With the help of joining different developed models and by analysing the visibility area from each centre, we can observe some interesting anomalies which definitely reveal conflict areas. Moreover, it is possible to analyse their evolution, suggesting that the territorial protohistorical history is not a continual process of development until the Roman conquest. On the contrary, it seems to be a more complex and dynamic system. Finally, my conclusion is that the protohistorical territorial system is too difficult to be understood solely by way of regressive analysis, because this system probably did not follow a strict hierarchical pattern with territories fitted together. On the contrary, we can think about a territorial dynamics pattern, based on a settlement network and different types of alliances between the centres. According to this model, the status of leader of Nîmes seems rather late and it is probably linked with the MaureSSIP's decline.

Thus, applying a reasoning that also includes the approaches presented in this paper, we are far from the continuity principle, which is often used, in regressive analysis, because of a lack of archaeological evidence. In this way, spatial archaeology and modelling can completely our perception of territorial dynamics.

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1 Notably those by Caesar, Strabo and the Pliny the Elder, between the middle of the 1st c. BC and the middle of the 1st c. AD.

2 According to the definition from Leonard R. and Longbottom J. 2000, see "Terroir":55.

3 "An area or group of rocks surrounded by rocks of younger age", according to Le Grand Dictionnaire Terminologique: http://w3.granddictionnaire.com/btml/fra/r_motclef/index102_1.asp.

4 Since the creation of the Roque de Viou site.

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