Mediterranean Landscapes in Post Antiquity

New frontiers and new perspectives

edited by

Sauro Gelichi and Lauro Olmo-Enciso

in collaboration with

Elisa Corro' and Manuel Castro-Priego

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Mediterranean landscapes in post antiquity: new frontier and new perspectives

Sauro Gelichi and Lauro Olmo-Enciso

The study of landscape has again in recent years been subject to considerable experimentation in archaeology. In particular, a series of new diagnostic instruments, often not invasive, has provided the opportunity to adopt a highly-innovative approach. Along with these new diagnostics (remote sensing, Lidar etc.), a series of approaches of geo-archaeological and paleo-environmental character have been strongly developed. This new situation has allowed also the rethinking of some theoretical orientations of approach; or, it can be said that these methods have been appropriately and profitably used in the service of a new theoretical and conceptual framework (giving them, at last, sense and a correct orientation). Of course this does not mean that the results deriving from them (the results of the researches which refer to those theoretical and methodological assumptions) are not exempt from old 'vices' (together with new 'virtues').

These new methods and these new theoretical approaches have allowed us to overcome the impasse following the great era of the 'surveys'; an era which, as is known, has characterized much of the best landscape archeology of the 70s, 80s and 90s of the last century. This was a period that represented, at best, the 'illusions' of processualism and which aspired to reconstruct the spatial arrangement of settlements in large areas and over a long period. The merits (and even more de-merits) of this way of studying the locality are known to everybody and there is no need to dwell on this point. However (and indisputably) one of the characteristics of this type of approach has been to focus on the recognition and the census of settlements. It is not surprising that one of the most problematic aspects of the discussion that has followed as a result of this type of archeology has been the need to qualify the concept of 'site' (and, conversely, that of 'off site').

These analytical trends have also featured in the Mediterranean area. Although the Mediterranean is the home of classicism (which also defines a particular archaeological methodology), it has seen the implementation of projects of this new kind, and in regions of Spain and Italy, after some delay, the proliferation of landscape archaeology studies. There are examples of more-or-less sophisticated post-colonial archaeological work, albeit conducted at the same time as examples of unreconstructed colonial archaeology. It is not easy to resolve a situation like this which requires the full integration of the different national archaeological cultures into a truly global forum. But some reflection on the cultural differences between the various landscape archaeologies, at least in the West is required. These considerations have given rise to the idea of this book which examines these themes in the framework of the Mediterranean area.

A second aspect of this volume aims to determine the chronological component. The past era of landscape archeology tended to move in the diachronic dimension of the 'longue durée'. It was the correct choice, which tended to break the traditional barriers that had characterized chronologically, and still characterize, our way of interpreting archeology. However, especially in recent times, a lot has been said about 'global archeology' or 'total archeology' in which the landscape becomes a sort of 'mega container'. It is a choice that made sense when it was intended to break down the hidden criteria of selective archaeology in the monumental or formal sense. But it is also a choice that shows its weakness when it ends up becoming, as often happens, an indistinct archeology, where everything has value (and thus, one might add, nothing has value); where everything is on the same level. The recovery of the concept of selection is therefore a salutary change; accordingly, we want to go back to retrieve a selection that is perhaps more congenial for us: a chronological selection. We believe that this recovery is entirely legitimate, but this will make sense if we know how to make sense of it, through the quality of the results that we can achieve.

When landscape or landscape archeology is discussed, we refer, of course, to a very complex concept (rather, one might say, a composite concept). Thus, in this book, we have proposed a variety of different landscapes for study (attributing to the word a very broad meaning in order to encompass the urban area). This seems to be a correct approach, an acceptable choice (and we gladly accept it). What is important, however, is the way in which some of these (old) problems are studied: not only through the application of new instruments but, above all, we would say, by the application of a new perspective by which the various aspects of the landscape are analyzed and connections established.

This book originates from a session organized by the editors at the EAA held in Istanbul in 2014 (T04 Environment and Subsistence: Geosphere, Ecosphere and Human Interaction: T04S010 Mediterranean Landscapes in Post-Antiquity: new frontiers and new perspectives).

The transformation of Medieval and Post-Medieval archaeology in Greece

John Bintliff

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Abstract

This contribution summarizes the delayed development of Medieval and Post-Medieval Archaeology in Greece, overshadowed for long by an emphasis on Byzantine art and architecture, and highlights recent developments in this fast-growing field.

Keywords: Greece, Byzantine, Crusader, Ottoman, folkore, vernacular architecture, archives, surface survey, deserted villages

Introduction

In the early 1970s, when I began my doctoral research into the prehistoric settlement patterns of Greece, both prehistory and the Greco-Roman eras were already major research areas in both museum and excavation studies. Landscape Archaeology was primarily a matter for prehistorians concerned with major settlements and classicists interested in identifying localities mentioned in ancient texts. However, while undertaking background reading for the several regions I selected for landscape analysis, it became clear that there already existed a long tradition in German historical geography of studying the regions of Greece in the genuine Longue Durée, to take the concept of Braudelian Annaliste history (Bintliff 1991). The pioneer work by Herbert Lehmann on Crete and in the Argolid, for example, strove to make sense of the 'sequent occupance' by local societies (Whittlesey 1929) from prehistory through Classical to Medieval and Modern, in well-defined geographical units (Lehmann 1937; 1939). Subsequently, the massive 5-volume work by Philippson and Kirsten (1950-1959), *Die Griechischen Landschaften* offered a complete cover of Greece and likewise progressed from geology through geomorphology, climate and vegetation into the localised history of human settlement in every era up to the present, supported by personal inspection on the ground that went back to the end of the 19th century.

The slow emergence of post-Roman archaeology in Greek lands

There had also been a precocious interest by archaeologists, especially British researchers, in the early years of the 20th century, in monuments, artefacts and sites of the Post-Roman periods, combined with folklore studies (Bintliff 2012: Introduction, pp.2-3; e.g. Traquair 1923), but as that century progressed Greek archaeology may have expanded in its practitioners yet at the same time as its focus grew ever-more specialized by period. During this process, the Bronze Age and the Classical Greek eras dominated, with rapidly-declining interest as one moved from later Hellenistic times onwards in time. Post-Roman archaeology came into neglect and was widely characterized as narrowly-focussed on Byzantine churches and icons (Rautman 1990).

In reality, steady progress was occurring, out of sight of academic researchers (and the vast majority of Greek tourists). Pioneer efforts had been made on major, long-running excavation projects such as the Athenian Agora, or the city of Corinth, to collect and publish Medieval and later ceramics and building-plans (e.g. Morgan 1942; Waagé 1933), and later, outstanding Greek scholars chose to specialize in Byzantine ceramics, not just decorated fine wares, but also domestic wares (Bakirtzis 1989; Papanikola-Bakirtzi, Mavrikiou and Bakirtzis 1999). Still considered apart, folkloric studies moved from displaying 'traditional' ceramics with little attention to their changing social and economic context, to detailed monographs on the history of Post-Medieval production centres and their distribution and use, linked to tracing the spread of exotic imports from both East and West (e.g. Korre-Zographou 1995).

Nonetheless, as I wandered around one Greek landscape after another on foot or bicycle (Bintliff 1977) the regular appearance of Post-Roman monuments neglected by signposts, let alone explanatory boards, produced mystification for me. In fact the nascent Greek state of the 19th century had purposefully set itself to bypass the millennia of foreign domination since the Hellenistic monarchs in favour of revealing the preceding eras of independent Greek communities and polities (Hamilakis 2007).

What was needed was a powerful stimulus to revitalize interest in the Post-Roman periods, and it came in the 1970s with the rise of extensive – and especially intensive – survey. Taking its cue from its parent in

the United States, regional survey was to use primarily surface ceramics, secondarily standing buildings, to recover every phase of landscape occupance, from the sporadic traces of Palaeolithic hunter-gatherers up to the contemporary villages. However, when we began our regional survey project in the province of Boeotia, Central Greece, in 1978, Anthony Snodgrass and I were expecting to mostly document prehistoric and Greco-Roman settlement patterns, and did not imagine that the later periods could be reconstructed with any useful precision. This, despite our rapid recognition that our landscape was studded with 'medieval' or possibly Ottoman (Early Post-Medieval) towers, while Boeotia possessed two outstanding rural monastic churches of Middle Byzantine date in Orchomenos and nearby (Skripou and Aghios Nikolaos sta Kampia, cf. Bouras 2006). A vital opportunity opened up when we persuaded John Hayes, the doyen of Late Roman ceramics in the Mediterranean (Hayes 1972; 1997) to study our survey pottery. Not only was he able to pronounce on the entire Greek and Roman material, but to our astonishment he had been developing an intimate knowledge of Post-Roman wares, Byzantine, Ottoman and later, not least through preparing the finds from the Saraçane excavation in Istanbul (Hayes 1992). To be told that a survey site produced 6th century BC or 5th century AD ceramics was one thing, but the revelation that it also produced 12th century or 17th century AD finds was for us quite astonishing. Quite suddenly we were able to produce settlement maps across the 1500 years or so beyond the chronological borders generally recognized previously, where texts and churches had had to serve to replace sites and ceramics as the primary evidence for Greek landscape history. Other survey projects were moving in the same direction, often building on Hayes' work and even using his skills at first hand (e.g. the South-West Argolid, Kea, Methana and Laconia Projects).

Another innovative step was taken by Charles Williams and Guy Sanders, who were using their roles as excavator and ceramic specialist respectively, at Corinth, to reconsider its Post-Roman town plans and ceramic sequence (Sanders 2000; Williams and Bookidis 2003). Sander's doctoral research investigated the medieval era on the Cyclades, where he combined survey finds with a study of medieval town plans, which still form a clear imprint in contemporary settlements (cf. Sanders 1996). As for the study of domestic buildings, rather in parallel with what we have seen with Post-Medieval ceramic studies, there already existed a strong publication history by Greek and foreign scholars in the disciplines of Folklore and Historical Geography, drawing, photographing and making formal descriptions of vernacular housing and village and town plans. One should highlight the most impressive of these products, the great series covering traditional private housing for all of Modern Greece in regional studies by the Athenian Melissa Press, much of which was available in several languages (Philippides 1983-1990). Nonetheless these were still to be connected to archaeological contexts and studied in a long-term developmental series.

In Boeotia, now that we had reliable ceramic series to place survey settlements into periods of a couple of centuries, it became obvious that Post-Roman sites were remarkably plentiful and indeed very recognizable in the landscape. Connecting their rise and fall with historical sources was not difficult to accomplish, especially with the Middle to Late Byzantine eras of the 9th-14th centuries AD, where abundant texts matched the dense spreads of contemporary ceramics lying above abandoned villages. The growth of population and rural colonisation over these 500 years were similar to the wider European and Near Eastern archaeological record. The transition from Late Antiquity however, long remained a problematic 'Dark Age', the 7th-9th century, Early Byzantine period. The decline of population, the almost total lack of clearly Medieval glazed wares, and the likely movement of people from Roman settlement foci to more secure refuge sites, meant that the nature of the ceramic assemblage to be sought for was totally unclear. The situation was further confused by the textual sources, which indicated that the Greek mainland was widely taken out of the Eastern Roman Empire's (Byzantine) control through the aggressive invasion of Slav tribes in the 7th-8th centuries; frustratingly, very little trace of 'Slav Wares' could be identified even at settlements known to have continued through the Early Byzantine era. A genuine 'Slav' cemetery at Ancient Olympia till recently remained an isolated example of this seemingly major human migration (Vida and Völling 2000) (just in the last few years, other examples have been uncovered from the Peloponnese). In fact research was to show that handmade wares often ascribed to Slavs were more likely to reflect the decline of industrial production in the Post-Roman period for domestic wares, and their replacement by locally-made, technologically-less complex products (cf. Rautman 1998). It also recently became clear, that just as in Italy, Spain and the Near East, Post-Imperial Roman ceramics for some centuries included sub-Roman versions of well-known Roman wares such as red-slipped tableware and characteristic transport and storage amphorae, confusable with their earlier prototypes (Armstrong 2009). Only in the last few years furthermore, has it also become possible to populate the Early Byzantine assemblage with distinctive ceramic types; this was achieved through careful attention to novel fabrics and decorative types in plainwares on excavation, and in survey site collections where the rise of the fabric-series has greatly improved the recognition of new pottery groups (Vionis, Poblome and Waelkens 2009). In some cases now we can suggest at least for Boeotia, that individual Late Roman urban

and rural sites, especially with defensive potential, became refuge foci in the troubled 7th-9th centuries, to be replaced by new open-landscape villages around 1000 AD following the reconquest of the Mainland by a resurgent Byzantine Empire (Bintliff 2012 Chs. 16-17, pp.351-401; Vionis 2008).

With the almost complete conquest of Greece by Frankish armies within the so-called Fourth Crusade in the early 13th century, the introduction of a distinctively feudal regime brought with it what has been called a 'transported landscape'. The few major aristocrats built castles to dominate their greater fiefs, although very few have been subjected to modern architectural or ceramic study (Chlemoutsi is a shining albeit recent exception, Skartsis 2012). Far commoner were the feudal towers constructed by the more numerous minor-fiefholders, maybe only controlling one or two Greek villages. Despite being noted by early West European travellers and the first topographers, their age and significance remained unclear. It was the achievement of a British medieval historian and architectural specialist, Peter Lock, to carry out the first in-depth study of a series of such towers within our Boeotia Project in the 1980s (Lock 1986). This firsthand experience with Frankish Greece encouraged him to follow this up with the first modern textbook history of the era (Lock 1995). We were able to confirm Lock's conclusions that the Central Greek towers were a fairly homogenous group, probably always close to and physically dominating a pre-existing Greek village and lacking a regional military watchtower role. Subsequently Sharon Gerstel and Mark Munn conducted a pioneer excavation of such a tower, also in Central Greece, together with its associated settlement (Gerstel *et al.* 1983). One important insight from survey archaeology was the discovery that, despite the imposition of a more demanding tax regime on Greek villages with the arrival of the Franks, indigenous settlements generally grew in size in Central Greece during the 13th-14th centuries under this alien regime.

The long better-known Early Medieval wares on these numerous villages bear witness to a second caesura, an almost complete abandonment in the 14th century. The effects of the Black Death and perpetual warfare between Byzantines, Serbs, Franks and Turks clearly took a massive toll of the Greek countryside, even if fortified towns survived in use. Investigating the subsequent 500 years of Ottoman control on the mainland, and the shorter episodes of Venetian rule on Crete and many Greek islands, suffered more from a lack of research than material, but the pioneering work of Hayes was followed by younger scholars such as Athanasios Vionis (e.g. Vionis 2008; 2012) and Pamela Armstrong (e.g. Armstrong 2002), mostly based on survey collections. Here moreover a new treasury of information would be unlocked: whilst Byzantine and Frankish sources were extremely restricted in spatial and chronological cover, hardly ever at the site-level, surviving Ottoman and Venetian Post-Medieval archives operated over entire provinces at the village, and for the latter even field, level. In our case in Central Greece, the study of 19th century maps and travelogues allowed us to identify some 75% of rural communities in Boeotia featuring in the tax-records of the Ottoman Empire. To be able to collect abundant sherds from a deserted Ottoman-era village, and map its extent and trade links, then compare the results with the changing population and land-use registered in the 'defters' proved fascinating in two directions: for archaeologists one could match our estimates of population size and ceramic wealth to the tax records, whilst for Ottoman archival specialists, fieldwork offered a chance to test how well those records followed reality on the ground (Bintliff 1995; Kiel 1997). In the Venetian and Ottoman Peloponnese similar links could be made between text and survey archaeology (Davies and Davis 2007; Zarinebaf-Shahr, Bennet and Davis 2005).

The study of deserted Post-Medieval rural sites led to the possibility of mapping rural society and economy at a community-by-community level; the example from Italy set by Mannoni and Blake, of registering relative prosperity through the penetration of more expensive ceramics to villages was in our minds (cf. Blake 1980). A highly innovative paper by Vionis (2016) explores the divergent economies and trade links of two of our rural villages in this fashion. But on many such 'DMV's' (deserted medieval villages) it was soon clear that there survived house outlines, churches (often still maintained by the villages moved to after abandonment), and even in the formerly exploited-landscape major water-installations which were datable from their listing in tax-archives. An exciting and undreamt-of possibility now arose of connecting the archaeological record to the rich publications of vernacular architecture readily available in the context of folklore publications. The particular rural house-form dominant in much of lowland Mainland Greece was a single-storey longhouse, in which some domestic animals shared space, and we could show that this type had already appeared by the final century of Latin rule, in the 14th century. The relatively slow rate of change in peasant domestic architecture meant that numerous examples could still be mapped in modern villages (Stedman 1996) and provincial towns (Bintliff *et al.* 1999), although over the last generation almost all have been demolished in favour of international-style concrete, multi-storey dwellings (Verweij 2009). Parallel recording was being carried out in the Peloponnese by an American project (Cooper 2002). Our own experience in Central Greece encouraged the initiative to map traditional houses across all of Greece and attempt a developmental sequence. Aalen (1984) had already given an excellent example from the Ionian

Islands of what could be accomplished in this fashion. A young Greek researcher undertook this mammoth but very rewarding exercise for his doctoral thesis and would publish it in an accessible monograph series (Sigalos 2004).

The decline of the Ottoman Empire, which included Venetian territories largely lost to Venice in the 17th to 18th centuries, was well-known from historical sources, but it had been little appreciated that the early Ottoman centuries, the 14th-16th, had seen a vigorous demographic and economic growth in most of its provinces. The evidence from tax records could now be confirmed by matching increasing village size from survey to the official registers, but likewise the fate of villages in that subsequent era was dramatically observed in field survey through the abandonment and shrinkage of rural settlements (Bintliff 1995; 2000; 2007a-b; 2012 Chs. 19-22, pp. 416-497). Nonetheless a new field of study has recently opened up for the later Ottoman and Early Independent Kingdom of Greece for the 17th-18th and 19th centuries respectively, using the entirety of preserved material culture alongside the accounts of Western Travellers and living memory to document the changing lifestyles of the rural peasantry and emergent professional and commercial middle classes (Forbes 2007; 2009a-b). The use of distinctive community formal dress, and widely-traded Greek and foreign ceramics, to represent local identities for diverse regional communities within Greece, allows us to signal various ways that rural societies sought to accommodate themselves to major political, social and economic transformations (Bintliff 2013).

Since the first stirrings of an independent sub-discipline of Greek Medieval and Post-Medieval Archaeology in the 1980s-1990s, we can observe a rapid evolution in terms of projects and publications, whose results can already be brought into comparison with the much-longer established traditions for these eras in adjacent South European countries like Italy and Spain (Francovich and Hodges 2003; Valor and Gutiérrez 2014). This has emboldened me to create a first synthesis of Greek Archaeology to go beyond Prehistory and the Classical-Roman periods right up to the 20th century (Bintliff 2012), followed up with an edited volume on a similar timescale (Bintliff 2015).

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The emergence of a modern form of Medieval and Post-Medieval Archaeology in Greece has been led in the first place by field survey teams with a commitment to research all periods present in a landscape, and here scholars such as John Cherry, Michael Jameson, Chris Mee, Hamish Forbes, Pamela Armstrong, Joanita Vroom, Athanasios Vionis, Pamela Armstrong, Timothy Gregory and Effie Athanassopoulos are key figures. On the excavation front Charles Williams and Guy Sanders have led the way on the Corinth Excavations. Our own work in Boeotia over the last 40 years has been sponsored by the British Academy, the Leverhulme Trust, the Belgian Fund for Scientific Research and INSTAP. The major contribution of numerous Greek scholars, especially in ceramics, is highlighted in the first part of this paper.

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Post-antique settlement patterns in the central Balkans: use of Justinianic landscape in the early middle ages

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Abstract

The authors examine reoccupation and refortification of the Late Roman and Early Byzantine hinterland hilltop localities in the central Balkans in the 9th and 10th centuries. This process is studied in the best researched area of Ras and its neighbouring territories, stretching between the Lim River in the west and the Ibar in the east and south. The Early Medieval fortifications there reflect the population clustering and the renewal of old communication routes along the major river courses. All these forts were built in the locations of Late Roman/Early Byzantine fortifications by the main artery along the Pešter Plateau, or along the valleys of Raška and Ibar. The Late Antique fortifications situated far from the main roads and deeper into the mountains were left uninhabited in the Early Middle Ages.

The refortification of this area and wider territories in the Balkan hinterlands was caused by the 9th-century Bulgarian expansion towards the west and the contemporaneous Serbian advance. One of the issues is to evaluate the model of fortification in the Early Middle Ages and its origins. In mountainous Balkan hinterlands, the geographical features of the terrain were considerably different from those in distant Slavic lands. In the central Balkans, Slavic military architecture drew from Late Roman and Early Byzantine experiences, modifying these patterns according to new needs, which resulted in the development of specific solutions.

Keywords: Central Balkans, Late Antiquity, Early Middle Ages, Forifications, Serbia

Introduction

Very little is known about Early Medieval settlement in the Central Balkans, because historical accounts are very scarce, and also due to the small overall number of archaeological finds. In Late Antiquity this was the territory of the Diocese of Dacia, including the provinces of Moesia Prima, Pannonia Secunda, Dardania, Praevalitana and parts of the provinces Dacia Ripensis and Dacia Mediterranea. The urbanisation patterns were determined by the geographical features of the terrain. The most urbanised part of this mountainous region, intersected by waterways and major valleys, was its northern fringe. The towns were surrounded by large plains and interconnected via large rivers – the Danube, the Sava and the Morava. The last one was particularly important, with its major tributaries cutting through the inland territory. These corridors with smaller and bigger valleys were used as communication routes. The most important towns were founded in the wider area of the Danube border – Sirmium, Bassianae, Singidunum, Margum, and Viminacium – and in its hinterland, in spacious valleys and at the main crossroads, as was the case with Naissus, Ulpiana, Scupi, etc. Some towns were located near major mining districts, e.g. Municipium Dardanorum.

Early Byzantine heritage

Although the towns were few, judging from a large number of fortifications built on the heights above the valleys and plateaus or in mountain ranges, mainly as places of refuge, it can be concluded that the whole area was inhabited in Late Antiquity, especially at the time of Emperor Justinian. Even a superficial analysis is indicative of a population move to the hinterlands from the northern border of the Diocese. This is best reflected in Moesia Prima. The fortifications were much more numerous in the southern part of this province, gravitating to the Western Morava River, than in the northern areas, along the Sava and the Danube. A significant concentration of fortifications is also encountered in Dardania and in the western parts of the Dacia Mediterranea Province. The process of population retreat to fortified settlements in Late

Antiquity has also been observed in other regions of the Empire (Ivanišević 2015a; 2015b).

The toponyms of certain forts, as recorded in Procopius, point to the character of the former settlements (Procop., *de Aed.* IV.iv). Some of them were built in the vicinity of large estates, mines or roads (Mirković 1996), and some others certainly had a military function, controlling the surrounding territories and communication routes. On the other hand, many fortifications were built in remote areas of the provinces, far from the main roads and, particularly, the towns. It is hard to judge the extent to which this new settlement pattern reflected the persistence of the indigenous population, in contrast to the Romanised towns (Figure 1).

Destruction of the limes and the loss of towns in the Kutrigur, Avar and Slavic raids led to the collapse of Byzantine rule over large parts of the Illyricum. The Diocese of Dacia was most threatened (Popović 1975; 1978), as the termination of life can be observed even on the hinterland fortifications. A number of them have been archaeologically explored; this process can thus be safely dated to the second half of the sixth and the beginning of the seventh century. From the absence of fire damage and traces of violence it can be concluded that, in many cases, fortifications were abandoned rather than destroyed. The small number of finds, particularly of pottery, suggests that they had been occupied for only a short time. With a sudden decrease in circulation during the second half of the 6th century, sporadic coin finds also testify to that effect (Ivanišević 2010), and the towns shared the same fate. It can easily be concluded that we are witnessing depopulation processes caused by the above-mentioned raids, but also by the Justinianic plague of the 540s and later, by earthquakes and climatic changes, and by the consequent reduction in basic agricultural productivity (Ivanišević and Stamenković 2014).

Early medieval fortifications

The consequences of depopulation were particularly striking in the next few centuries. In the 7th and 8th centuries, vast territories were only sparsely inhabited

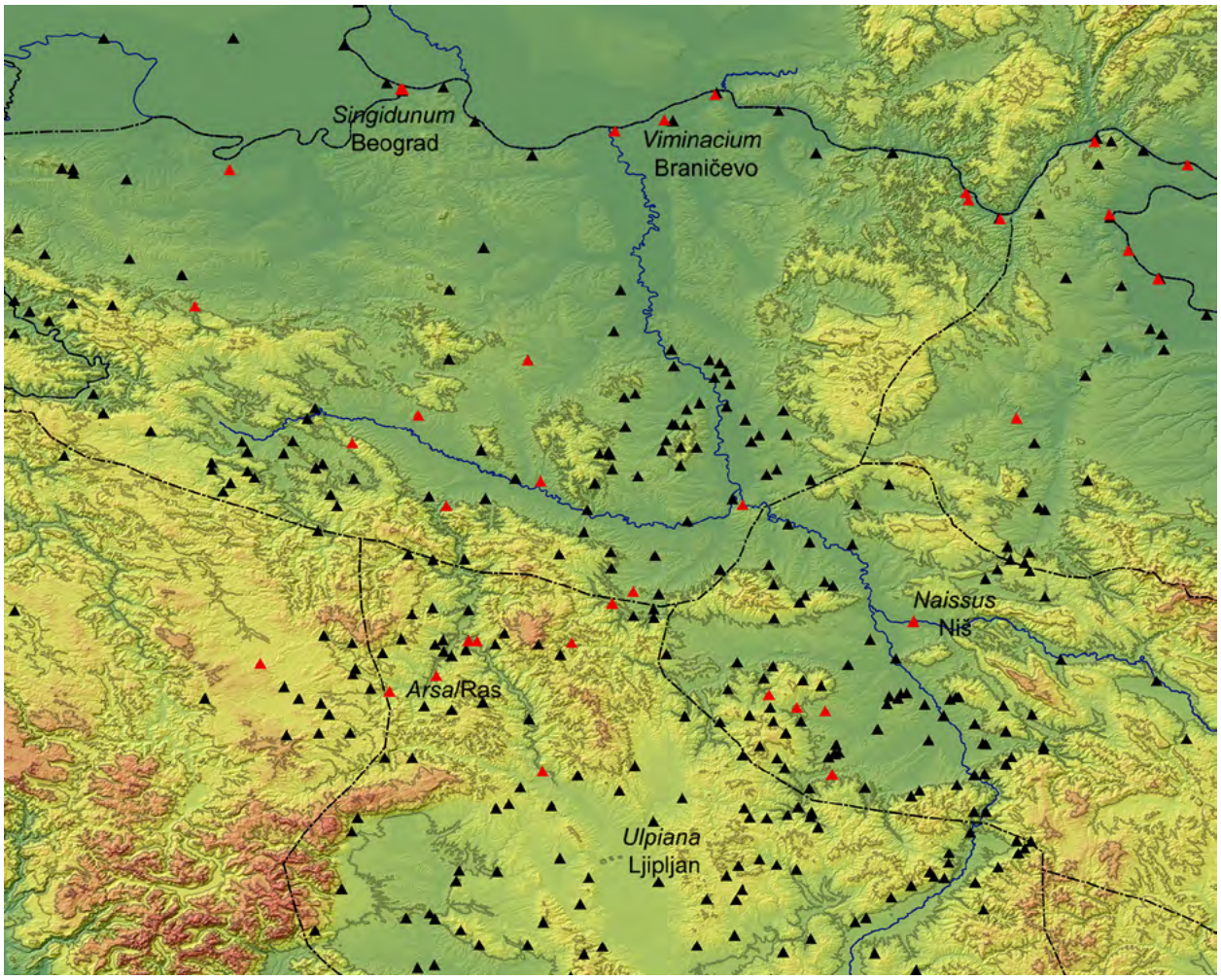

Figure 1. Diocese of Dacia: Late Roman (black) and Early Medieval (red) fortifications (after Bulić 2013: Pl. 5, with additions by the authors).

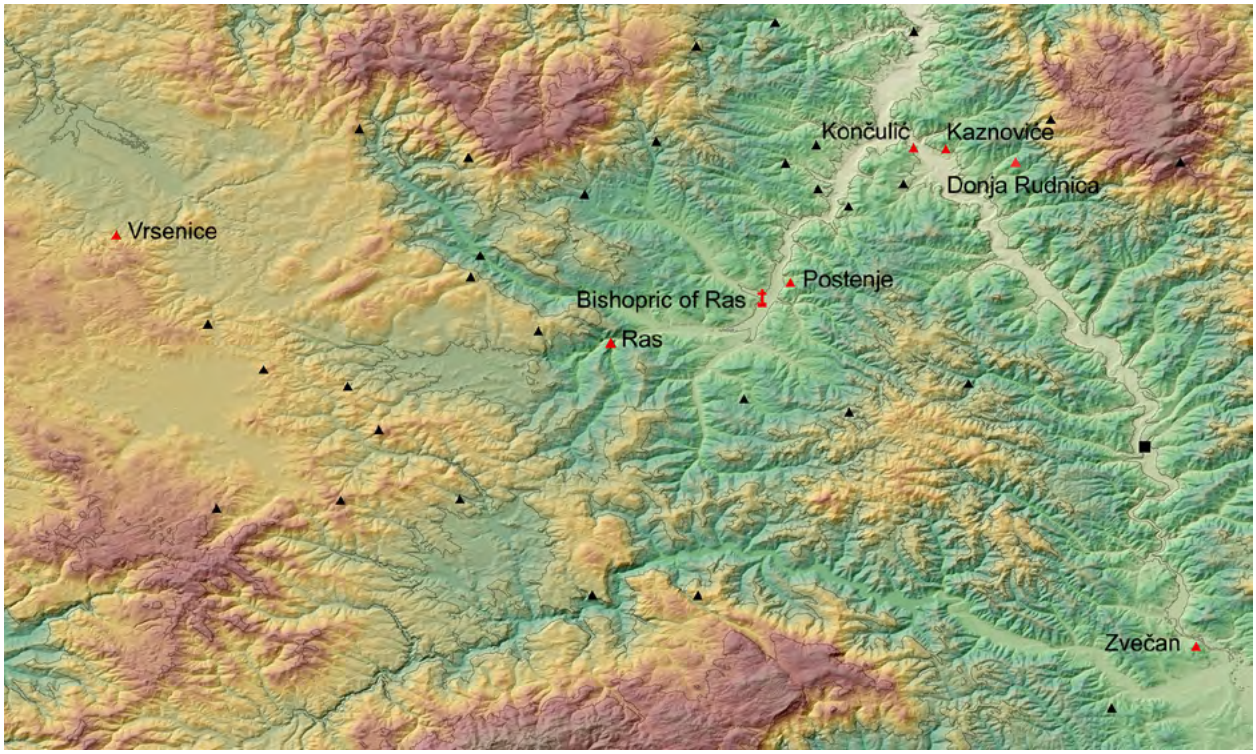

Figure 2. Region of Ras: Late Roman (black) and Early Medieval fortresses (red).

(Curta 2013: 196-197). Sporadic settlements and traces of material culture stretch mainly along the Danube limes (Slatina by Brza Palanka, Kula Mihajlovac, Korbovo, Prahovo and Veliki Gradac), with very few finds from the Balkan hinterlands. The few 7th century Byzantine finds from the Central Balkans (Bugarski 2012) were not outnumbered by the Slavic ones (Bugarski and Radišić 2016).

Regarding the renewal of life in the hinterland settlements, some scholars believe that it occurred only a few decades after their abandonment. The beginning of the Early Medieval phase at Velika Gradina in Miločaj, Gradina on the Jelica and Majur by Jagodina has been dated by Dejan Bulić to the 7th century (Bulić 2013: 191-199). According to the director of the excavations, Mihailo Milinković, this horizon at Gradina on the Jelica spanned the 7th to, roughly, the 8th or 9th century (Milinković 2010: 204), while Bulić dated it somewhat more generally, between the 7th and the 10th (Bulić 2004).

We will focus on Gradina on the Jelica, as this site has been excavated for three decades now, bringing to light a significant sample of finds, though restricted to pottery only. Other sites produced only a few pottery shards each, not enough to draw more far-reaching conclusions. On the basis of analogous finds, Early Medieval pottery from Gradina, recently processed by Vesna Bikić, may be attributed to the end of the 8th and, especially, to the 9th or 10th century, but not earlier (Milinković 2014: 50-51). It is striking that virtually no other finds were dated as Early Medieval by Milinković (Bugarski and Ivanišević 2013: 141, 145), even though a significant percentage of all pottery from this site belongs precisely to that period.

Accordingly, there exists as yet no archaeological evidence of reoccupation of the Late Antique hinterland fortifications in the 7th and 8th centuries, and the conception of an early fortification activity in the Balkan hinterlands should be refuted. Similar are the cases of Early Slavic forts on the Elb River, previously dated to the 7th or even 6th century, with new dendrodates clearly pointing to their construction in the late 9th and early 10th century (Machaček 2010: 474-476), and of the shift in dating of the Early Medieval fortifications in Poland (Buko 2010).

From the available material, especially pottery, it is likely that the wave of reoccupation and refortification of the Late Roman and Early Byzantine hinterland hilltop localities started in the 9th century. During the past few decades a number of forts producing evidence of a 9th-10th century occupation have been surveyed and excavated, but mostly on a small scale and only a few of them systematically, which makes any conclusion a statement of probability rather than a definite one (Bulić 2013: 191-208). The picture is far from complete, as vast territories have not been sufficiently explored. However, at present it appears that the bulk of the Early Medieval fortifications were

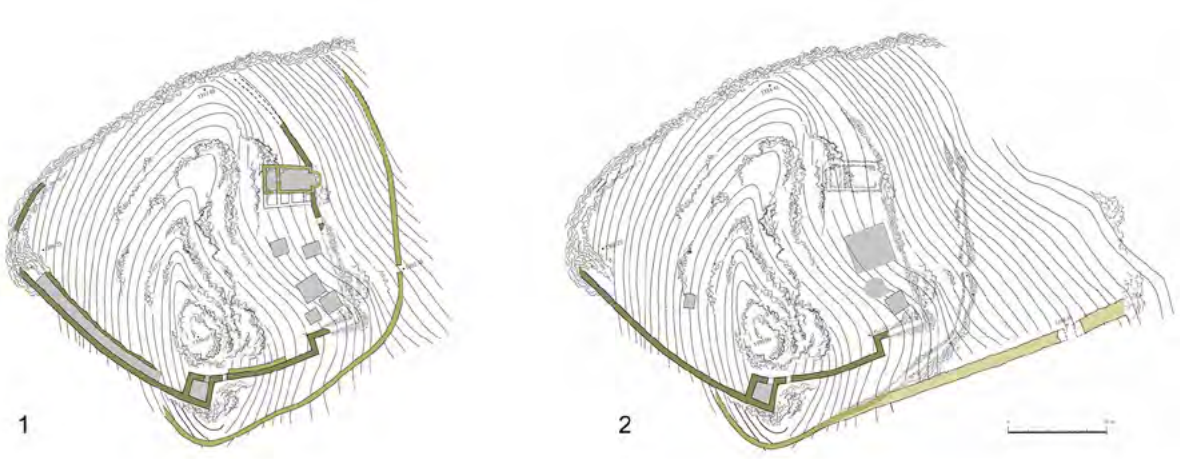

Figure 3. Vrsenice Fortress: 1. Early Byzantine phase; 2. Early Medieval phase (after Popović and Bikić 2009: Figures 32 and 78).

situated in elevated positions framing the Western Morava, Southern Morava and Ibar valleys and their tributaries. They reflect the population clustering in these areas and the renewal of old communication routes along the major river courses.

To understand how the network of Early Medieval fortifications adjusted itself to the 'Justinianic' space use pattern, we will try to study the best researched area of Ras and its neighbouring territories, stretching between the Lim River in the west and the Ibar in the east and south. The northern boundary of this zone is the Golija massif. In Late Antiquity this zone was divided along the eastern fringe of the Pešter Plateau between two provinces, Dardania and Praevalitana (Figure 2).

Given the scope of the surveys undertaken, small-scale and systematic excavations, this is as yet the best explored region in present-day Serbia holding evidence of Early Medieval occupation. A total of 30 fortifications have been registered along the Ibar, in the minor river valleys and around the Pešter Plateau, chiefly refugia. Some of them were built at very high altitudes, like Vrsenice at 1300 m and Hum at 1500 m above sea level (Ivanišević 1988; Popović and Bikić 2009: 10-11). Despite such a rough terrain, the ninth-century fortifications were erected in the locations of Early Byzantine forts in Vrsenice (Popović and Bikić 2009: 95-133), Ras (Popović 1999: 139-161), Postenje (Mrkobrad 1997), Gradina by Kazanoviće (Bulić 2007), and Gradina by Končulić (Bulić 2008). According to Dejan Bulić, to this group of fortifications also belongs the one at Djerekare, but this cannot be accepted as it has failed to produce any Early Medieval pottery (Bulić 2013: 197; Milinković 1983). On the other hand, to this list should be added the fortification at Donja Rudnica, southeast from Kazanoviće, from which came the heart-shaped belt fittings of Bulgarian origin (Documentation of the Institute of Arcaheology, Belgrade). The fittings match the finds attributed to the CX/8 type of the reference typology, dated to the end of the ninth and the tenth century (Pletnjov and Pavlova 1994-1995: 64, 116, 125, 162-163, Cat. nos 459, 460, T. XXVI/459-460).

Just as in the Early Byzantine period, these Early Medieval fortifications come from two different geographical units. Vrsenice is situated at the Pešter Plateau, in the territory of the former province of Praevalitana, while the rest of the forts cluster above the narrow Raška valley and by the confluence of the Raška and Ibar rivers, in what was once the Dardania Province.

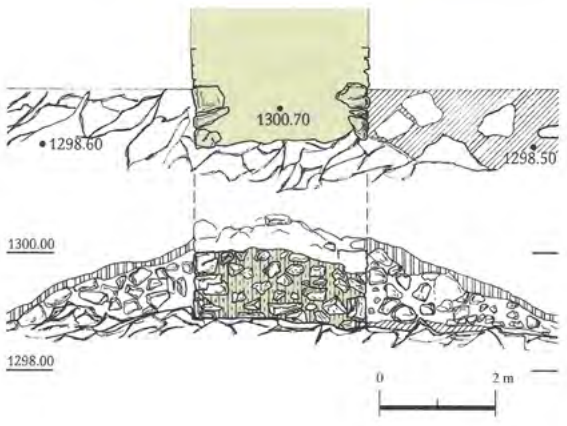

Figure 4. Vrsenice Fortress: Early Medieval rampart (after Popović and Bikić 2009: Figure 81).

Figure 5. Vrsenice Fortress: Early Medieval houses (after Popović and Bikić 2009: Figure 83).

Especially important for our discussion is the Vrsenice fortification. Built in the center of the plateau, the oldest fortification at Vrsenice dates from the 4th century. In the 6th century, it was enlarged to 0.92 ha with a new rampart in the south and the east (Figure 3.1; Popović and Bikić 2009: 31-95). In the course of the 9th century, the defended area was again enlarged with a dry-stone rampart encircling the southern and eastern slopes suitable for habitation. In the west, the partially rebuilt Early Byzantine rampart was still in use, as was the main tower, found to contain Early Medieval material, and in the north there is a cliff as a natural obstacle. This fortification covered some 1.5 ha (Figure 3.2). This significant enlargement of the defended area in comparison to the size of the Early Byzantine fort must have been closely connected to the importance of this position in the Early Middle Ages. Situated at the center of the plateau, the fortification controlled the communication junctions, and especially the route leading from the Adriatic coast to remote Balkan hinterlands.

The newly-built rampart was considerably different from the older ones. Preserved up to 2.50 m of the presumed total height of 3.50-4 m, it was 3 m wide. The faces were built of large stones and parts of rocks, while the inner space was filled with smaller stones and dark red earth (Figure 4; Popović and Bikić 2009: 95-133).

Only a small number of buildings uncovered within the ramparts can be easily dated to the Early Medieval horizon. The houses are rectangular in plan and of different dimensions. House 1 was a 5 m by 3 m large wattle-and-daub hut, while the wooden walls of House 4, covering 12 m by 12 m, had their lower parts built in dry stone. Several other huts were also constructed over older buildings. This is particularly evident in the case of House 2, which had small wooden annexes in its later phase. Another two houses, labelled 3 and 5, were built over the older ones, but their plans could not be recorded (Figure 5; Popović and Bikić 2009: 95-133). This settlement was apparently established at some point in the 9th century, with no elements for a more accurate dating. The authors do not think that it was used for a long time, but was rather abandoned already in the opening decades of the 10th century (Popović and Bikić 2009: 122).

The situation was quite different in the eastern part of the area. Here there was a concentration of forts above the Raška and Ibar Rivers: Ras, Postenje, Gradina by Kaznovići, Gradina by Končulić, and Gradina by Donja Rudnica, all built in the locations of Late Antique fortifications, clustered in the radius of only 25 km. The two largest fortifications, Ras and Postenje, defended the western and northeastern approaches to the Novi Pazar Basin.

The Early Medieval fortress of Ras emerged on top of the well-preserved remains of a 6 ha large Late Antique fortress (Figure 6). As large parts of the enclosed space were covered with cliffs and rocks, the original fortification was not entirely occupied; the settlement developed on the terraces and small plateaus on the northern and eastern slopes. According to Marko Popović, the Early Medieval fortification reused the well-preserved older ramparts – southern, northern and western – while only the eastern one had to be partly rebuilt as a 1 m wide dry-stone wall. The remains of its inner face, preserved in two to three rows of stones, have been uncovered to the length of 7 m (Figure 6).

In addition to this, another rampart has been traced, enclosing the southern suburb plateau. The faces of this rampart, 2.75 m wide in its base and tapering up, were built of large stone blocks, and the inner space was filled with smaller stones and earth. It is preserved to a length of 30 m and a height of 2.10 m. A wooden palisade fence is said to have been founded in this stone wall, which may have been 2.50 m high (Figure 7). This rampart, dated to the 9th-10th centuries, represents the only modification of the Late Antique fortification. It was built to help protect the southern

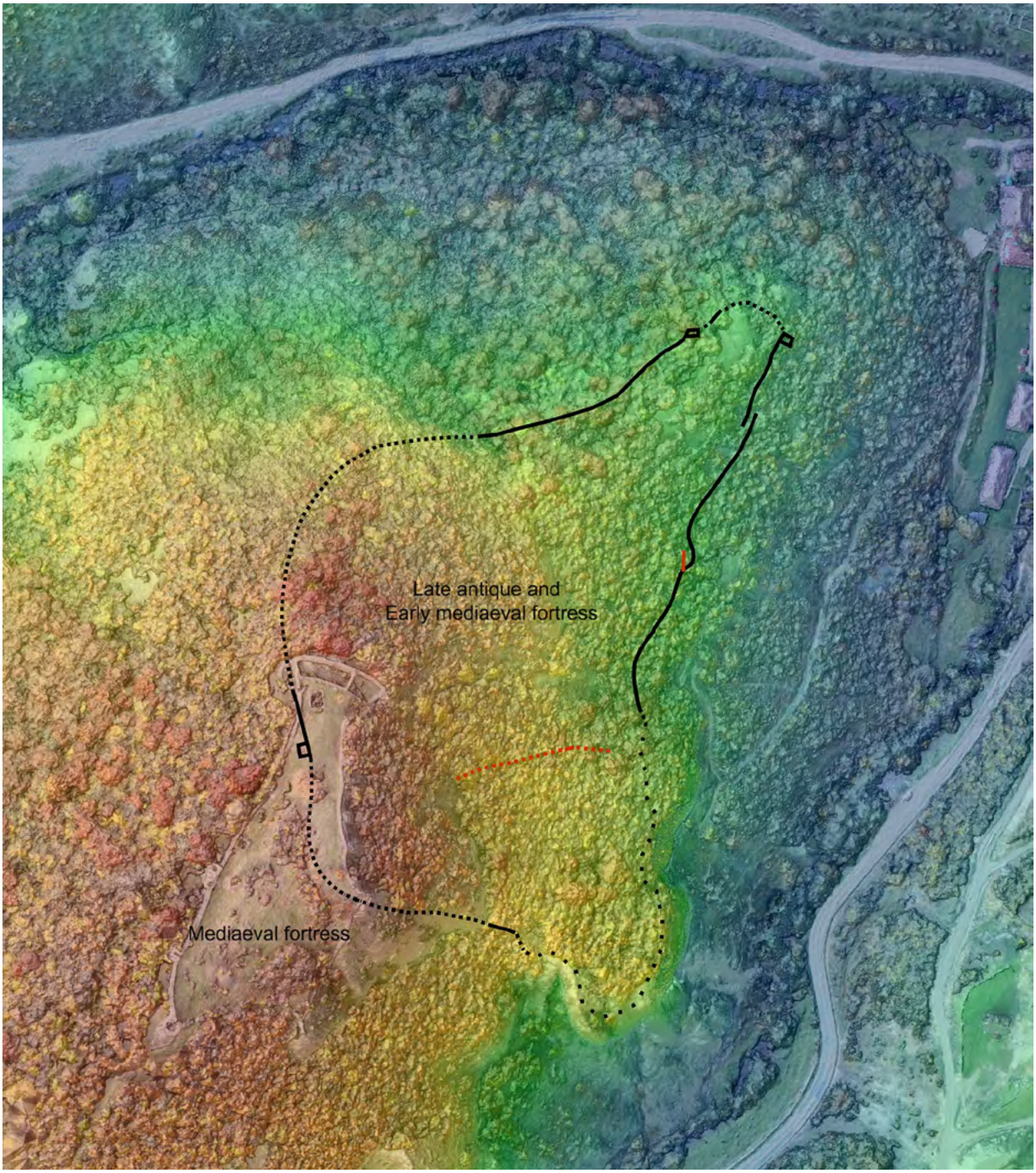

Figure 6. Ras Fortress: Late Antique (black) and Early Medieval (red) phase (after Popović 1999: Figure 85 and aerial photogrammetric DEM, Documentation of the Institute of Archaeology, Belgrade).

part of the fort, defended by the cliffs from the east and south, and by the peak of Gradina from the west. A part of the 6 ha large Early Medieval fort, this 'inner fortification' extended over some 1.8 ha.

The ruins of Early Medieval buildings were uncovered across the fortress, in its northern, eastern and southern parts. In the northern part a 4 m by 4 m large hut was explored, built on a stone substratum (House 23), and similarly sized was House 27 in the northeastern sector (Figure 8), next to which a large hearth was found. House 24 from the southern sector had almost the same dimensions – 4.20 m by 3.50 m – but was all built of wood (Popović 1999: 139-161).

The reoccupation of the Late Roman and Early Byzantine fortification is dated to the second half of the 9th century at the latest. In the course of the next century the settlement grew, to be abandoned by the end of it. A century later, towards the end of the 11th

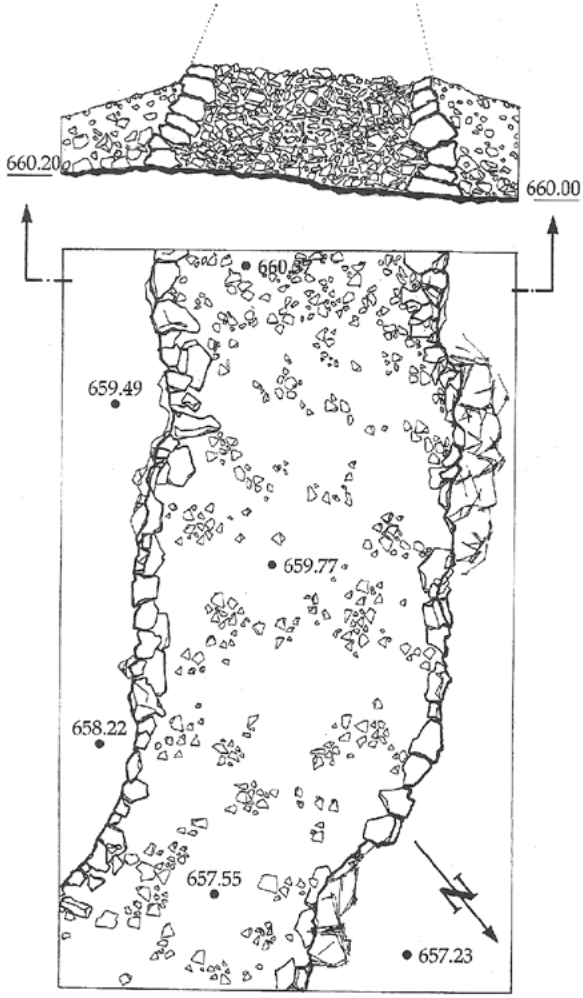

Figure 7. Ras Fortress: Early Medieval rampart (after Popović 1999: Figure 86).

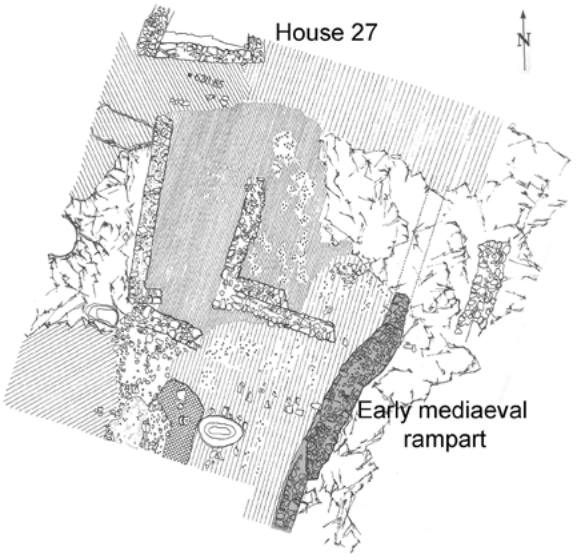

Figure 8. Ras Fortress: Early Medieval houses (after Popović 1999: Figure 95).

and into the 12th century, an entirely new Byzantine fortification was constructed over parts of the previous ones, enclosing the very peak of Gradina and the surrounding slopes (Popović 1999: 296-302).

The Early Medieval fortification at Postenje occupies the top of the mount dominating the Raška valley and the Novi Pazar Basin. As concluded by Dušan Mrkobrad, similarly as with Ras, this important stronghold followed the Late Antique plan. Even the Late Roman buildings – including houses, two Early Byzantine churches and the so-called Great Palace – were supposedly reused in Early Medieval times (Figure 9.1), when the old fortification with its tower was partly renovated. As in the case of the above-mentioned fortifications, the construction of the Early Medieval fort at Postenje was chronologically attributed to the second half of the 9th century, but its end was ascribed to the 12th. Judging by the published plans, throughout this large time-span the size of the fortification never changed (Figure 9.2).

According to Mrkobrad, the fortification consisted of two units, the Upper Town, 230 m by 90 m large, or 1.6 ha, and the Lower Town. Taken as a whole, the ramparts of both units ran for more than 350 m, and it is claimed that to the northeast there was another fortification ring. From all these data it appears that the fortification covered much more than 1.6 ha as drawn in the published plan (Mrkobrad 1997).

The refortification of this area and wider territories in the Balkan hinterlands was caused by the 9th-century Bulgarian expansion towards the west and the contemporaneous Serbian advance. These events were described in *De administrando imperio* by Emperor Constantine VII Porphyrogenitus, a crucial source for our understanding of the relationships then existing between the Bulgarians and the Serbs, including important information on the border between them. Thus we know that from 836 to 852 the Serbian Prince Vlastimir successfuly confronted the Bulgarians, and his sons Mutimir, Strojimir and Gojnik also met with success. Later on, a large Bulgarian army was defeated, led by Khan Boris who would later convert to Christianity, assuming the name Michael (852-889). Khan's son Vladimir and twelve Great Boyars were imprisoned and, soon after the truce, escorted to the border, in the area of Ras (*DAI*, 32.35-53).

This area, packed with fortresses, was most certainly in the border zone, but there are different historians' opinions on whether it belonged to the Serbs or the Bulgarians. According to Mihailo Dinić (1978: 38), Ras could have belonged to the Bulgarians, as it was not mentioned in Porphyrogenitus' list of 'settled fortresses' in 'Baptised Serbia' (Blagojević 2011: 42-46). There were also views that the border was more to the east, on the fringes of a wider region (Novaković 1964;

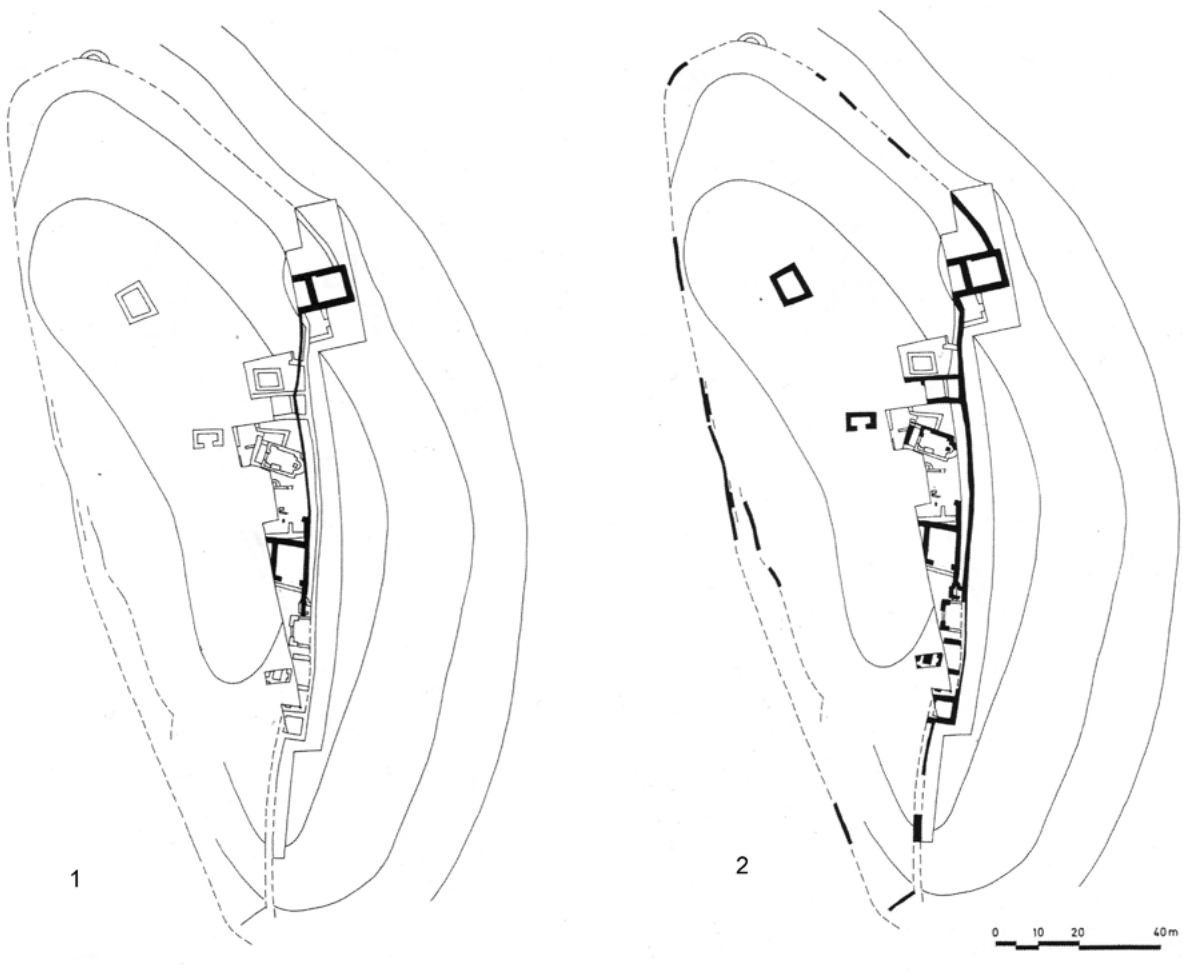

Figure 9. Postenje Fortress: 1. Early Byzantine phase; 2. Early Medieval phase (after Mrkobrad 1997: Figures 3 and 4).

1968). On the other hand, Predrag Komatina believes that there was no strictly definded border between Serbia and Bulgaria, but rather a narrow, or perhaps somewhat wider, unsettled buffer zone beyond any immediate control of either state (Komatina 2015). The abandoned Late Antique fortifications may be regarded as testimony to spacious uninhabited areas; presumably these were the 'desolate towns' mentioned in *De administrando imperio* (Ćirković 1998: 9-10; Živković 2008).

What makes the area of Vrsenice and other fortifications so important is that in the 10th century the church of St. Peter and Paul was built in the middle of it, to become the center of a newly-founded Bishopric. Among other ecclesiastical centers, Ras was mentioned in the Second Novella of Emperor Basil II from 1020 (Figure 2), enacted to complement the previous one after which all the Bishoprics of the former Bulgarian Church, from the time of Emperor Peter (927-969), were to come under the authority of the Archbishop of Ohrid (Kalić 1979: 33, with references therein). The Bishopric of Ras was among the smaller ones, like the Braničevo and Prizren Episcopacies: the latter two had 15 clerics and paroikoi each, and the larger ones, like those of Belgrade, Niš and Skoplje, 40 each (Müller and Dölger 2003: 217-219, n. 806-807).

Conclusion

To conclude, there were two distinct units in the Raška Region, the first with Vrsenice as the central fortification at the Pešter Plateau, and the second with its fortifications encircling the Bishop's seat in the church of St. Peter and Paul. Application of the Thiessen model indicates that the Vrsenice fortification controlled a vast territory of 643 km^2. The fortresses in the Raška valley, Ras and Postenje, together with those from the Ibar valley – Končulić, Kaznoviće and Donja Rudnica – all controlled much smaller area, 291 km^2 in total. This discrepancy may be only partly explained by the fact that the eastern part of the first area, along the Lim River, which could actually make the zone watched over from Vrsenice smaller, is not sufficiently explored. Yet, it is still larger than that controlled by the fortifications from the Raška and Ibar Valleys.

Secondly, the concentration of fortresses in the Novi Pazar Basin points to a higher population level there, which must have been the reason for establishing the Ras Bishopric in the 10th century.

On the other hand, these two Early Medieval space use patterns share some common features. All the forts were built in the locations of Late Roman/Early Byzantine fortifications, by the main communication route along the Pešter Plateau (Vrsenice), or along the valleys of Raška (Ras Fortress, Postenje) and Ibar (Končulić, Kaznoviće and Donja Rudnica). The Late Antique fortifications situated far from the main roads and deeper into the mountains were left uninhabited in the Early Middle Ages. This model of refortification can be observed along the Western Morava Valley and particularly along the Danube corridor, a key communication route on the eastern fringes of the Balkans.

An obvious criterion for reuse of fortifications was the degree of preservation. This is best illustrated by adhering to the original fortification plans, repairing the towers and ramparts and even rebuilding them, as at Ras. Vrsenice offers a different example, as this was the only fortification enlarged by 50 percent, which is highly indicative of its importance. On the other hand, many Late Antique forts were left abandoned. The reason for this must be sought first and foremost in the above-mentioned depopulation processes: the Early Medieval Balkan population was smaller in comparison with Late Antiquity.

In such a changed setting, new inhabitants of this area had at their disposal numerous options for locating the forts. Apart from the preservation degree, the main criteria appear to have been strategic considerations and the size of particular earlier fortifications. If both criteria were met, an Early Medieval fortification was to be put up. This is also why small Late Roman/Early Byzantine hillforts, or refugia, were left uninhabited – the 'desolate towns' of Constantine Porphyrogenitus (Živković 2008).

The two different concepts of reoccupation of the fortifications in the area of Ras point to different organisation structures, but at this stage it is not clear if this leads to any more substantial conclusion. On the other hand, analyses of the fortification interiors also reveal some differences in their organisation. Most of the buildings can be described as houses, covering up to 15-20 m^2. At Vrsenice, however, the 144 m^2 large two-room House 4 has been explored. In its size and with the lower parts built in dry stone, this building differs from all others at the site and at the Ras Fortress. Therefore it was suggested that this was the home of a local nobleman (Popović and Bikić 2009: 101-103, 130). In our opinion, it might have had an 'administrative' purpose (Figure 5). The same could apply to the large building at Postenje, named 'Great Palace' by Dušan Mrkobrad (Mrkobrad 1997). Regrettably, the results of his excavations were not properly published and hence cannot be of any further use in this discussion.

The small number of finds from the forts does not allow for conducting the social stratification and spatial distribution analyses. On the other hand, their erection is a clear sign of a new organisation, which included the reintroduction of communication routes and trade, and more generally, of the evolution of Medieval society.

As in Vrsenice there were no finds of Bulgarian origin, in contrast to the Ras or Donja Rudnica fortresses, it has been suggested by Marko Popović and Vesna Bikić that this fort was situated within the borders of 'Baptised Serbia'. It is then hypothetically identified with Destinikon (Δεστινίκον, Δοστινίκα), one of the eight inhabited fortresses there (Popović and Bikić 2009: 132-134), which is in line with some earlier historians' deliberations. Already in the second half of the 19th century, Konstantin Jireček concluded that this town was located in the border area between Serbia and Bulgaria, near present-day Sjenica (Jireček 1951: 55), and a similar opinion was put forward by Sima Ćirković (1998: 29). Destinikon was an important stronghold, as *De administrando imperio* mentions that Klonimir, on his return from Bulgaria, entered this Serbian fort to take over the throne (*DAI* 32.74–77). On the other hand, Predrag Komatina advocates the identification of this town with Drstnik/Drsnik in Metohija (Komatina 2015: 38; Korać 2002: 26).

The second Early Medieval center in this area was at Ras, located in the 'Fortress of Ras' (Popović 1999: 297-306) or, according to some authors, at Postenje (Kalić 2013: 440-442). Judging by the size of the localities, both fortresses played an important role in the 9th and 10th centuries. From the 11th to the beginning of the 13th, however, the importance of the Ras Fortress was underscored with the building of an entirely new Byzantine, and later on Serbian, fortification (Popović 1999: 300-304).

One of the issues is to understand the concept of fortification in the Early Middle Ages and its origins. According to Joachim Henning, the Slavs received it from the west (Henning 2002: 143). This is certainly true for Slavic fortifications along the border with the Frankish Empire (Machaček 2010: 475). In mountainous Balkan hinterlands, however, the geographical features of the terrain are considerably different from those in distant Slavic lands, also offering some already existing infrastructure (Popović and Bikić 2009: 7). Slavic military architecture drew from Late Roman and Early Byzantine experiences, modifying these

patterns according to new needs, which resulted in the development of specific solutions. Respecting these parameters, the Vrsenice fortification was significantly enlarged, while the fortresses of Ras and Postenje maintained the sizes of the Late Antique fortifications.

The Early Medieval fort at Jelica, outside this region, developed in the significantly reduced space of the previous fortification's highest plateau, enclosed with a newly built rampart (Milinković 2010: 205-206). A common feature of all these Early Medieval fortifications is that instead of walls built with mortar thick dry-stone ramparts were constructed, with faces of large stone blocks or pieces of rock. Along with living in huts, these are characteristic of the new, Early Medieval architecture.

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Time travelling: multidisciplinary solutions reveal historical landscape and settlements (a case study of Sant'Ilario, Mira, VE)

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Abstract

This is a multidisciplinary research about the interdependence between the history of the settlements and the geomorphological and hydraulic issues nearby Venice from the 9th century until the present day. The case study is the Early Medieval monastery of Sant'Ilario, one of the most prestigious and ancient religious institutions of Venice, and the surrounding area. The professionals involved are a geologist, an archaeologist and a geo-archaeologist. Furthermore a programmatic source is based on the extensive use of public information, available free from public institutions and from previous university projects. Large amounts of data were open and accessible and one of the aim of the research is the systematization and their mutual comparison in a global perspective.

Keywords: Venice Lagoon, Geoarchaeology, Geomorphology, Early Medieval Archaeology, Venice History

Introduction

The monastery of Sant'Ilario was one of the most prestigious and ancient religious institutions of Early Medieval Venice. It was founded in the dawn of Venice's history and it was the site of many ducal burials during the Early Middle Ages. Its importance is clear, even if considering only the circumstances of its foundation: about ten years after the moving of the capital from Malamocco to Rivo Alto, the Doges Giustiniano and Agnello Partecipazio allowed the monks of San Servolo, an island south of Venice, to move to a more suitable place. Thus, the religious community obtained the ducal chapel of Sant'Ilario and the surrounding area. The location was different from the other monasteries of the lagoon: while other early medieval religious communities were distributed on the islands of the archipelagos of Rivo Alto, in the middle of the lagoon, Sant'Ilario rose on the mainland at the perilagoonal border. This research springs from a question: why there?

Today, nothing remains of the monastic buildings, and the site is just a marginal cultivated area in the countryside of Dogaletto di Mira (Venice). As is well known, the Venetian lagoon and its hinterland have been greatly and constantly modified over the centuries by both artificial and natural events. The existing sharp border between dry land and the lagoon is completely artificial. It was developed mainly between the 15th and 20th centuries, when the efforts of the hydraulic engineers of Venice were focused on protecting the lagoonal environment from fresh water. Moreover, medieval written records describe several fluvial diversions. In particular, the huge River Brenta resumed flowing through our sample area during the 12th century, and triggered a chain reaction of environmental transformations (Primon, Furlanetto and Mozzi 2004). The case study of Sant'Ilario clearly required coordinating the study of the interdependence between the history of the settlements and the geomorphological and hydraulic issues which have characterized the landscape from the 9th century until the present day. In other words, a multidisciplinary strategy was necessary.

During the project we analysed the entire historical period: however, in this paper we will focus on a crucial time range: from the 9th century, when the monastic community moved to Sant'Ilario, to the 16th century, when the aristocratic family of Foscari built the Palladian estate of La Malcontenta. After a description of the methodology, we will proceed with a brief geological and geomorphological frame. Then, we will present the results of our research, organized according to chronological periods, as a journey in time through the history of Sant'Ilario and its surrounding area.

E.C.

Research team and methodology

This research has been inspired by the project 'Archaeological Park of the Northern Adriatic Sea – PArSJAd', a European strategic project of landscape archaeology funded by a cross-border cooperation programme between Italy-Slovenia and the Regione Veneto, which considered landscape study as a synergic analysis of natural and artificial elements (2007-2013, Gelichi *et al.* 2013). Initially, the area of Sant'Ilario, corresponding more or less to the present-day district of Mira (Venice), was excluded from PArSJAd sample areas, due to the low visibility of buried deposits (see below). The importance of the site for Venetian history, and the radical transformation of the fluvial network over time, suggested extending the analysis. Indeed, investigating this area was essential in understanding the general transformation of the environment and its relation with Venice and its inhabitants between the Middle Ages and the Early Modern Age.

Focused research on the landscape of Sant'Ilario started in 2014 under the direction of Sauro Gelichi, within a 'Project of Relevant National Interest – PRIN'. The team group is composed of experts in different fields, who already have had the chance of cooperating in PArSJAd fieldworks.

The professionals involved are a geologist, an archaeologist and a geo-archaeologist. The approach has been based on a continuous dialogue between the different points of view and expertise, going beyond boundaries of single disciplines, and endeavouring to integrate apparently unrelated evidence and results. In other words, teamwork has been identified as a key factor in understanding limits and potentialities of different skills. Another programmatic source was based on the extensive use of public data, available free from public institutions and from previous university projects. Large amounts of data were open and accessible; however, the lack of systematization and their sector-based use had limited the mutual comparison in a global perspective. The long-time activities of Provincia di Venezia (Geological sector, person in charge: Valentina Bassan), University of Padua Padua (Dept. of Geoscience: Aldino Bondesan, Paolo Mozzi, Alessandro Fontana, see for ex. Bondesan and Meneghel 2004; Bondesan *et al.* 2008b; Fabbri *et al.* 2013), Ca' Foscari University of Venice (Dept. of Humastic Studies, Laboratory of Medieval Archaeology, Scientific supervisor: Sauro Gelichi) should be mentioned in this respect. The sample area was initially studied through geological data, archaeological surveys, historical cartography and aerial photo interpretation, to identify the main features of this landscape, and providing a preliminary chronology of its evolution. Moreover, the results have been integrated with the study of Medieval and Modern written records to refine the diachronic transformations, to help the reconstruction of paleo-environments, and to understand human exploitation during these changes. For instance, the Sant'Ilario monastery archive is a real mine of information. In particular, documents with incidental descriptions of landscape, travel notes, and functional documents, such as descriptions of

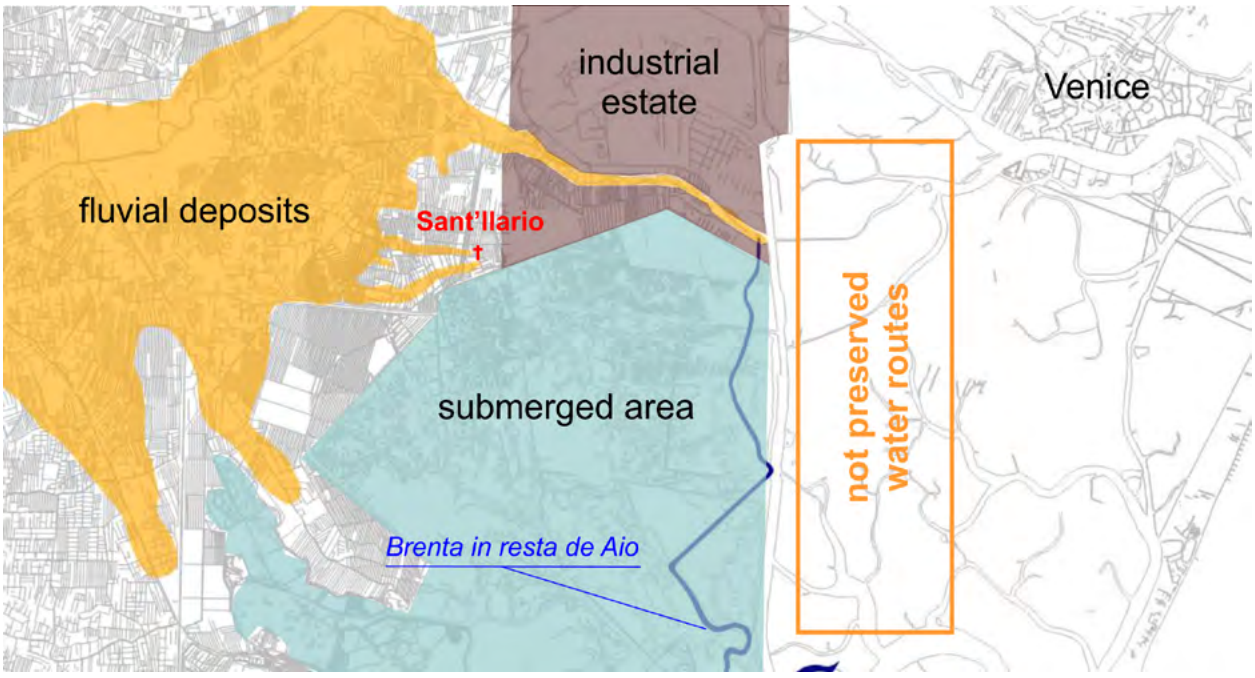

Figure 1. Scheme of the present landscape around the ancient site of Sant'Ilario monastery.

boundaries, have been extremely important both in supporting interpretation and in orienting the research. Historical analysis is being effectively considered as a fundamental guide for selecting sample areas for further fieldwork, avoiding widespread and uncoordinated research in a region affected by continuous changes from Antiquity until today. The present district of Mira is characterized by a road network perfectly integrated with rivers and canals. Today, the main fluvial system is determined by the River Brenta, which flows through an intensively cultivated countryside, directly overlooking the edge of the lagoon. It is certainly the result of several natural events and intrusive human activities, starting in the 12th century, when a branch of the huge River Brenta was diverted, and it is still in action at the present day. It makes analysis of the landscape of this area difficult (Figure 1). The main difficulties are summarized as follows:

- Archaeological deposits are almost completely hidden. The western area is covered by fluvial deposits of the River Brenta, and the south-east zone was certainly once flooded by lagoonal waters (i.e. Fondazione Musei Civici di Venezia, Museo Correr, Gabinetto di Cartografia, *Donà Delle Rose*, no. 51. Autor Giovanni Antonio Locha, watercolor drawing mm 430 x 580, year 1582). In the north several extended land reclamations were undertaken, many of these in the Late Middle and Early Modern Ages using lagoonal mud (ASVe, SEA, *laguna*, dis. 70/2 and dis. 70/3; ASVe, SEA, *relazioni*, b. 61, dis. 12). Furthermore, during the last century, man has completely changed the northern area: the industrial petrochemical complex of Marghera and its network of roads and canals have so radically modified the aspect of landscape that is now almost unrecognizable.
- Fluvial deposits were transported by the several artificial or natural branches of the River Brenta. From the 12th century, they have been the principal cause of the transformation of the landscape. However, their features are not a dating element, and neither provides information about how long a riverbed has been occupied by the water of the River Brenta, or when it was deactivated. Moreover, the natural tendency of water to follow the slope of the terrain determines a new occupation of ancient riverbeds by new water courses. The unstable hydrological network of Mira makes this area a real palimpsest, and difficult to unravel.
- From the 14th century, numerous hydraulic works which were carried out to protect the city of Venice from fresh water and marshes, permanently diverted the ancient water routes between the mainland and the lagoon. In particular, the construction of the *Cava Nova*, dating back to 1324, and then of the *Brenta in Resta de Aio*, could be identified as the earliest and most radical artificial changes. They were diversions which diverted the water of the River Brenta into the southern area, protecting Venice from the expanding marshes. It is clear that this changed the original courses of natural channels. The natural passage from dry land to marsh, and eventually to salt water, was completely lost.
- The change of landscape was fast, as the memory of its past appearance vanished rapidly. Even in the 12th century, the inhabitants appeared very confused about names and river courses of few decades before: the original water routes were already partially forgotten. Written records and historical cartography disclose significant variations in names of places and canals. Furthermore, identical or similar names were frequently used for very different features, or suddenly substituted. For instance, *fiume atterà* or *Brenta atterà* (literally: earth-filled river or earth-filled Brenta) occurs in many maps to identify different riverbeds. Thus, a clear distinction of the areas mentioned in the documents is difficult and sometimes impossible.
- Land reclamation also raises the problem of false positive interpretations of archaeological materials on the surface. As mentioned before, they covered wide areas of the ancient territory, hiding the original traces of occupation. Moreover, especially during the Modern Ages, they found their way into urban waste, causing significant contamination: pottery in particular may erroneously be interpreted as evidence of settlement. Moreover, mechanized agriculture of the last century requires wide flat areas to allow the passage of motor vehicles. Therefore, even gentle slopes and mounds, often corresponding to man-made activities, have been completely levelled, removing later materials and spreading early archaeological materials around out of context.

The use of written records had to deal with the problematic nature of the monastic archival sources. The authenticity of many documents is in doubt: ancient counterfeits and interpolations have been recognized, raising questions as to the reliability of the information contained in documents (Cessi 1921; Lanfranchi and Lanfranchi Strina 1965: VII-XXXVIII; Sopracasa 2004). We did not enter into the merit of palaeographical issues, accepting all the previous studies available. However, where uncertainties regarding the authenticity of ancient texts have sprung from features of landscape perceived as far-fetched, we have proceeded with a rigorous comparison with archaeological and geological information. As a general

chronological criterion, we ascribed the territorial description to the period when documents were written, ignoring references to preceding proprietary assets.

C.M.

Geological frame

The sample area can be briefly described as a perilagoonal low plain with a dense hydrographical network. It is a transitional environment, characterized by river deltas, waterlogged valleys and many land reclamations. From a geological point of view, the area is composed of continental, deltaic and lagoonal sediments produced by the alternating depositional and erosional processes that took place from the Late Pleistocene to the present. During the Last Glacial Maximum (LGM – 30,000-17,000 years BP), when glaciers had their maximum extension, the plain passed through an important evolutionary phase. The sediments deposited by alpine rivers formed large systems, defined as alluvial megafans, that formed the current Veneto plain.

During the Holocene, the sea level rose continuously as a result of the combined effects of the post-glacial eustatic sea level rise and the local land subsidence. An initial marine transgression progressively transformed the plain into a lagoonal environment. At the same time, rivers were continuing to deposit their sediments in prograding deltas. In the lagoon, the Rivers Brenta and Piave delivered large volumes of sediments which, redistributed along the coast, provided the sand for the building of the barrier islands that separate the lagoon of Venice from the open sea.

While, during Middle Ages and the Modern Era, the coastline gradually moved forward in the northern and southern lagoon; the central part presents less variation: the island of Lido, which divides the lagoon from the sea, was a rather stable element. On the other hand, the perilagoonal border changed considerably over the ages.

The maximum regression of the lagoon, due to fluvial deposits, is well documented by historical cartography of the 15th century (ASVe, SEA, *laguna*, dis. 9). Its maximum extension can be estimated on the basis of

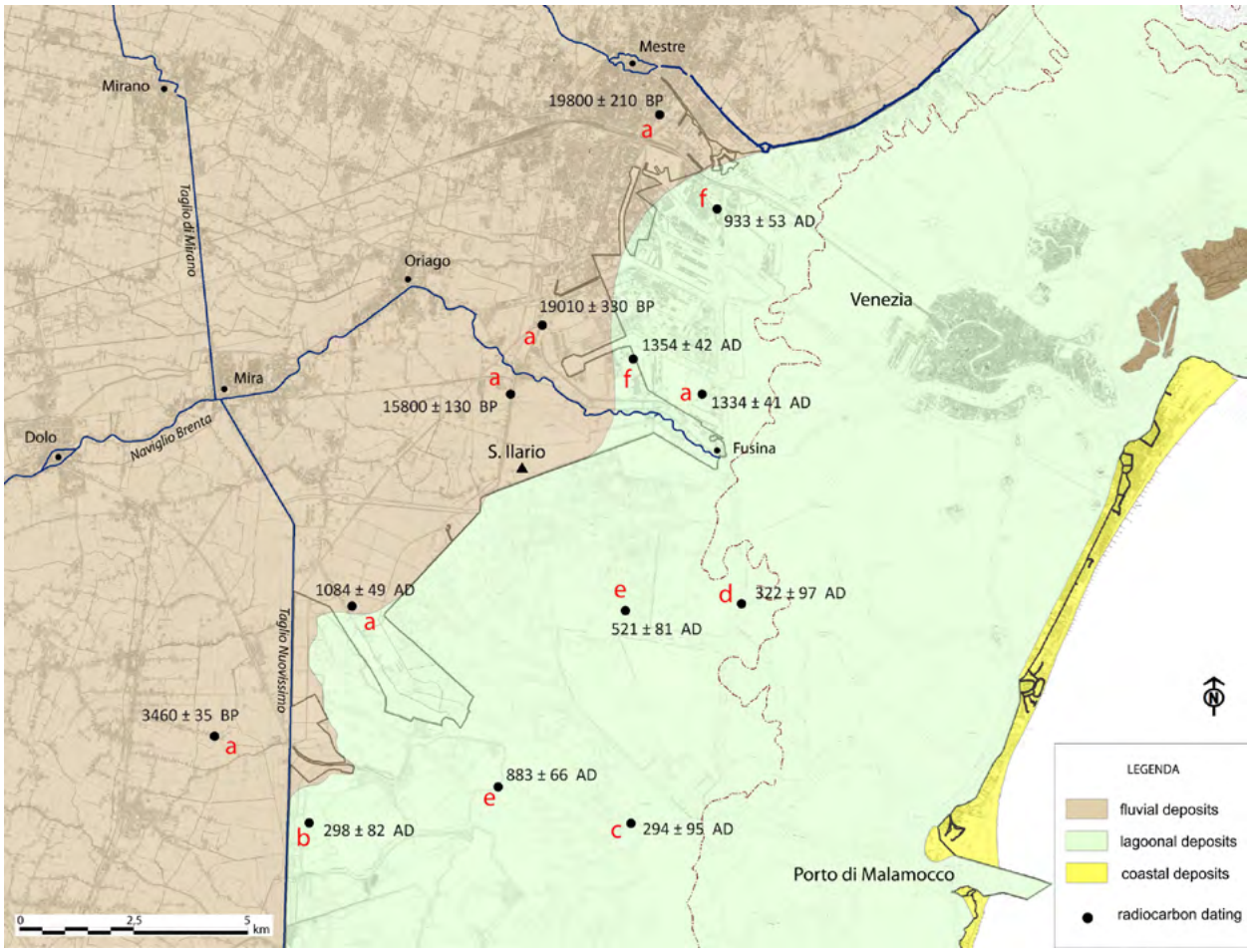

Figure 2. Radiocarbon datings used in this work: a) Bondesan, Primon, Bassan Vitturi 2008; b) Tosi, Rizzetto, Bonardi, Donnici, Serandrei Barbero, Toffoletto 2007; c) Pirazzoli, Planchais, Rosset-Moulinier, Thommeret 1979; d) Bonatti 1968; e) Marcello, Spada 1968; f) Mozzi, Bini, Zilocchi, Becattini, Mariotti Lippi 2003. Radiocarbon calibration with Calpal 2007 (The CalPal Online Radiocarbon Calibration).

coring and radiocarbon dating of organic soil in the area. The low density of information does not allow a precise drawing of the perilagoonal border at the time of the formation of the lagoon (5000 years BP, Serandrei Barbero, Donnici and Lezziero 2002, Figure 2). However, it is reasonable to hypothesize that in the sample area the difference between these two extremes is 5-10 km. Moreover, the perilagoonal border does not prograde steadily; on the contrary, it advances and retreats, mainly due to fluvial deposition and the absolute eustatic sea level rise. In other words, the presence of a river outlet determines the deposition of debris around it that gradually fills the surrounding lagoon. The rate and extent of the deposition depend on the characteristics of the rivers. For instance, major alpine rivers, as the Brenta, carry a significant amount of sediments, while groundwater-fed rivers generally have a low rate of deposition.

The present hinterland can be subdivided into three different geological units (Bondesan *et al.* 2008b, Figure 3), all of them generated by fluvial sedimentation of the River Brenta over different long periods: the lower one (Mestre unit, in the north) is dated back to the Pleistocene (14000-15000 years BP), subsequently (II millennium BC) the Camponogara unit was formed in the south. Then, in the centre of the area, there are Holocene alluvial deposits of the Brenta (Dolo unit). The Sant'Ilario monastery was located on the Pleistocene plain, surrounded by Holocene deposits. Providing a chronological sequence of the latter has been one of the main goals of this research for determining the landscape features before, during and after the presence of the religious community.

Firstly, Holocene deposits (Dolo units) have been divided into sedimentary units, based on microrelief analysis and coring (Figure 4). The presence of layers of sands and silty sands respectively suggest the existence of river beds and natural banks. This information has been compared with the presence of palaeo-river beds from aerial and satellite photography and with information concerning active or deactivated water courses from historical cartography. The interaction between the hydrological network and the lagoon has always been taken into account; moreover, the geological chronological scale has been refined through written and archaeological records.

One of the most useful instruments for our analysis is the so-called 'Valier Map' (ASVe, SEA, *laguna*, dis. 5), a copy made by Nicolò dal Cortivo in 1540 of an older drawing or description (ASVe, *Proc. di S. Marco de ultra*, b. 68; Dorigo 1983: 84). The map represents several watercourses

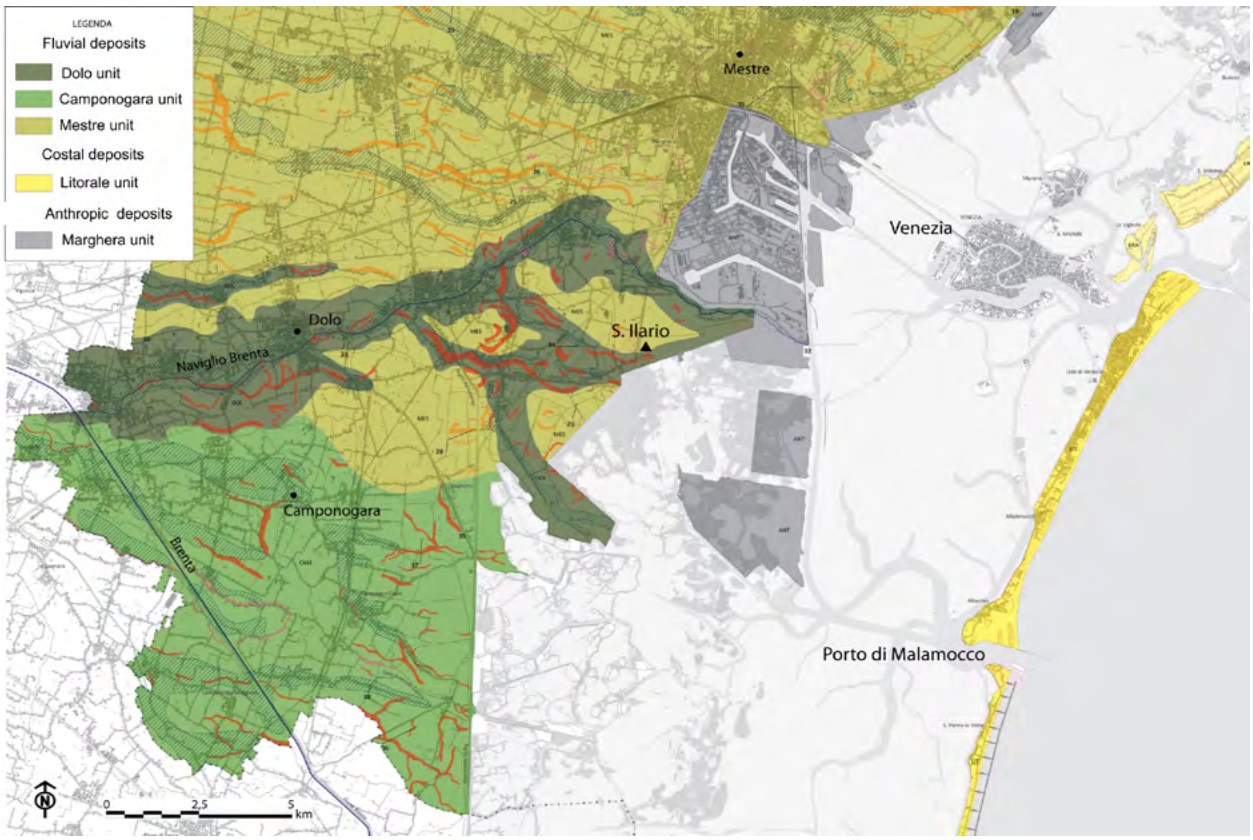

Figure 3. Geologic units of the area around the ancient site of Sant'Ilario monastery (from Bondesan, Primon, Bassan, Fontana, Mozzi, Meneghel, Abbà, Vitturi 2008).

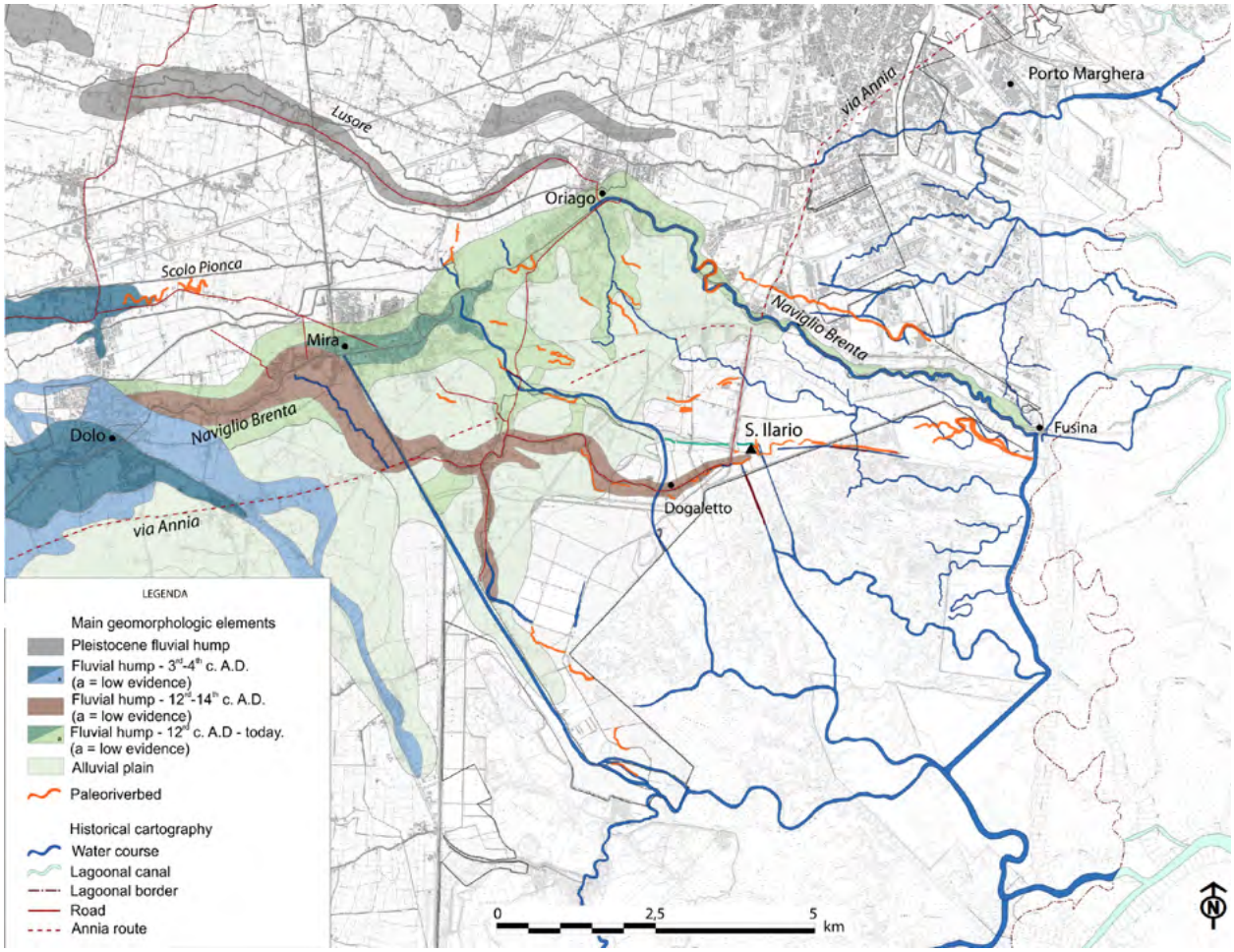

Figure 4. Geomorphologic frame of the area around the monastery of Sant'Ilario.

which completely disappeared in later representations of this landscape. Furthermore, it distinguishes between active and inactive riverbeds, coloured brown as they were already buried in the Late Middle Ages. Several palaeo-environmental features, such as marshes, lakes and fluvial ridges, are sketched. Therefore, it could be considered as an ancient geomorphological map.

In the following paragraphs we will start our travel in time through the history of Sant'Ilario and its surrounding area.

S.P.

Before Sant'Ilario: the Roman period

During the Roman period, the presence of a branch of the Brenta in this area can be identified near the village of Sambruson, where it is clearly recognizable as a fluvial ridge, crossed by the relief of the Annia consular route. Traditionally it is interpreted as *Medoacus*[1] *Maior*, one of the *stationes* listed in the Peutinger Table (Talbert 2010). Three corings made in the lagoonal basin in this area have intercepted levels of peat, compatible with a freshwater marsh, confirming the past proximity of a river. All the radiocarbon datings are closely related, and attest to the presence of a fluvial route between the end of the 3rd and the beginning of the 4th centuries AD (Motte di Volpego: Bonatti 1978; Torson di Sotto: Pirazzoli *et al.* 1979; Valle Averto: Tosi *et al.* 2007, Figure 5). Its deposits may have caused the perilagoonal border to move eastward, and consequently the enlargement of the available mainland, as is confirmed by evidence of a forest in that area (see next paragraph). However, the activity of this branch did not last long: the bed of the consular road clearly covers the fluvial ridge, proving that the river was naturally or artificially diverted before the end of the Roman period. Indeed, the main course of the River Brenta (*Medoacus* in Latin) flowed in the south until the 7th century, as confirmed by radiocarbon dating of a peat level. Its principal mouth was presumably located in Brondolo, south of Chioggia.

Despite the lack of systematic archaeological research, the evidence of Roman settlements in the district of Mira is clear. Roman materials have been recovered at various

[1] *Medoacus* is the Latin name of Brenta.

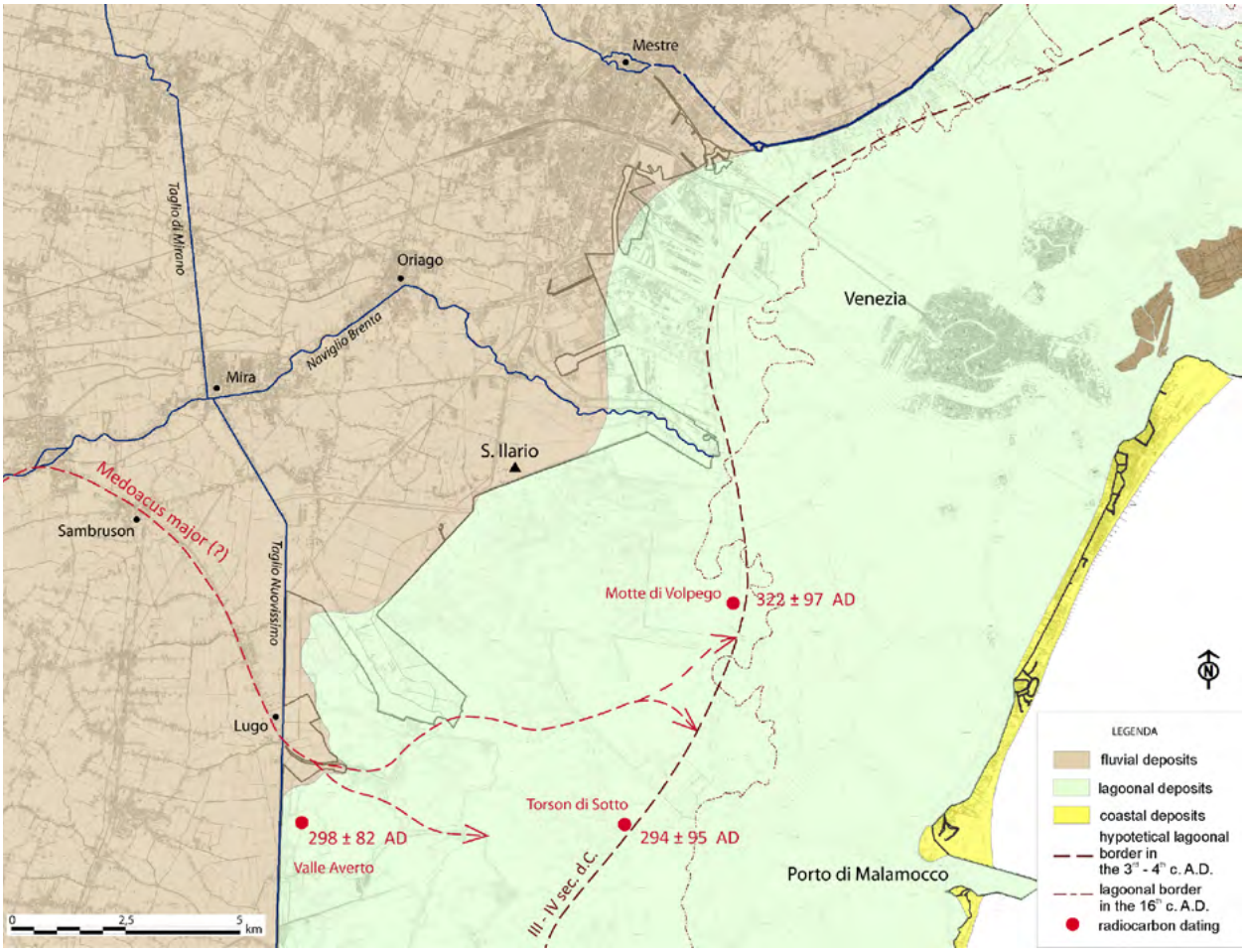

Figure 5. Paleoenvironmental reconstruction: late antiquity.

times in several sites (Canal 2013; Capuis 1994), and 18th century excavations near Fusina (Temanza 1761: 24) brought evidence of a necropolis to light. Furthermore, in the first half of the last century, Luigi Conton, a local scholar who examined the whole Mira district, reported the significant frequency of Roman finds, in particular between Sant'Ilario and a place called Moranzani, 1 or 2 km to the north (Conton 1940). Also in the monastic area, although Roman strata are not definitely identified, the amount of residual pottery produced between the 3rd and 7th centuries suggests an occupation preceding the arrival of the monks (Calaon and Ferri 2008; Calaon, Ferri and Bagato 2008; Gelichi and Moine 2013).

E.C.

The early middle ages and the foundation of Sant'Ilario

The monastic community did not leave the island of San Servolo to occupy an uninhabited land. As mentioned, they obtained the already existing ducal chapel of Sant'Ilario, from which they took the name of the monastery. In the Early Middle Ages the area was characterized by a relatively stable environment, crossed by a groundwater-fed river. The ecosystem was the result of a balance between fresh and salt waters, and its landscape appears as a gradual transformation from a countryside crossed by rivers, to wetlands surrounding river mouths, to salt marshes, and then to the lagoon basin. Watercourses were characterized by a low flow rate, a short length and nearly no deposition of sediments, that minimized silting, waterlogging and floods. The early monastic archive mentions several watercourses that followed the borders of the initial land property (Lanfranchi and Lanfranchi Strina 1965: 17-24). The River *Una* probably flowed close to the monastic buildings, the River *Clarino* was located to the west, and *Lova* and *Seuco* canals were probably water routes that connected the mainland with the lagoon to the south (Figure 6).

Corings made in the lagoon area next to the monastic property suggested that in the past, the ground was not only dry, but probably occupied by a forest. Numerous logs in their original position have been identified, and radiocarbon dating suggests that these trees lived between the 6th and 9th centuries. Species identified are ash and alder (Marcello and Spada 1968). Furthermore, it may be assumed that the forest

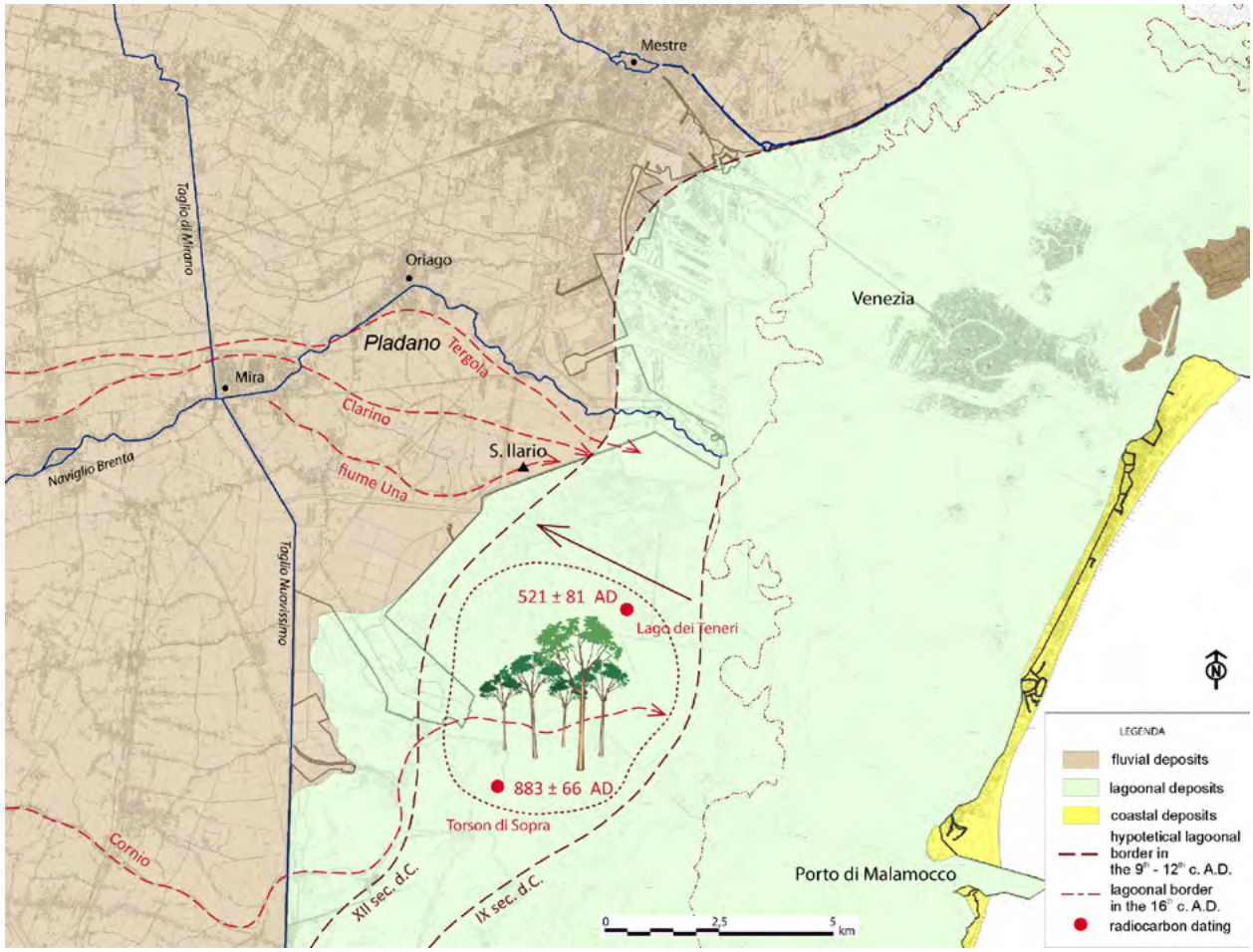

Figure 6. Paleoenvironmental reconstruction: Early Middle Ages.

expanded to the north, not far from Fusina, where in the 18th century several large roots were exposed above the Roman remains. In this case, the determination of the species is not very definitive, however it has been recognized as oak (Temanza 1761:24). The causes of the disappearance of this forest can only be hypothesized: they could be ascribed to natural factors, such as the progressive rise of the sea level between the 9th and 12th centuries (Zezza 2014), as well to human activities, such as cutting timber for buildings and ships. Indeed Rivo Alto was built in the first half of the 9th century. Furthermore, Medieval texts report that a large fleet of warships was supplied in about 840, under Doge Pietro Tradonico (Gelichi 2015: 87). While oak is considered a good material for shipbuilding, ash and alder are definitely unsuitable, but widely attested in Medieval buildings and land reclamation in the lagoon. In any case, the marine ingression, mainly due to the progressive sea level rise, and perhaps increased by deforestation, caused the moving of the lagoonal border nearer to the monastic buildings.

In 819, the Doges provided a large area in the south-west mainland of Rivo Alto, furnished with an abundance of wood, several waterways and natural resources. The economic exploitation was varied (Lanfranchi and Lanfranchi Strina 1965: 7-17): fields, vineyards, forests and livestock in the dry areas, pastures and fishponds and bird hunting in the wetlands. Harbours are mentioned in written records, but features of rivers suggest that they were passages between overland routes and navigable itineraries to the lagoon, rather than landing places along large waterways. Incidental annotations in written records may point in this direction: Giovanni Diacono tells that the Doge Pietro Orseolo, fleeing from Venice in 978, arrived at Sant'Ilario, where he received horses to reach the city of Vercelli (Giovanni Diacono: 167). Even in the second half of the 11th century, it is documented that the marsh of *Ortulis* was reserved for pasturing the abbot's horses (Lanfranchi and Lanfranchi Strina 1965: 90-96). Despite the lack of focused archaeological research into the matter, we can imagine that Sant'Ilario was a changing point of modes of transport between ground and water routes, perhaps connected with the few surviving sections of the Annia road. The first significant addition to the monastic land property was the area called Pladano, a territory spread along the River Tergola, in the north of the main property (Lanfranchi and Lanfranchi

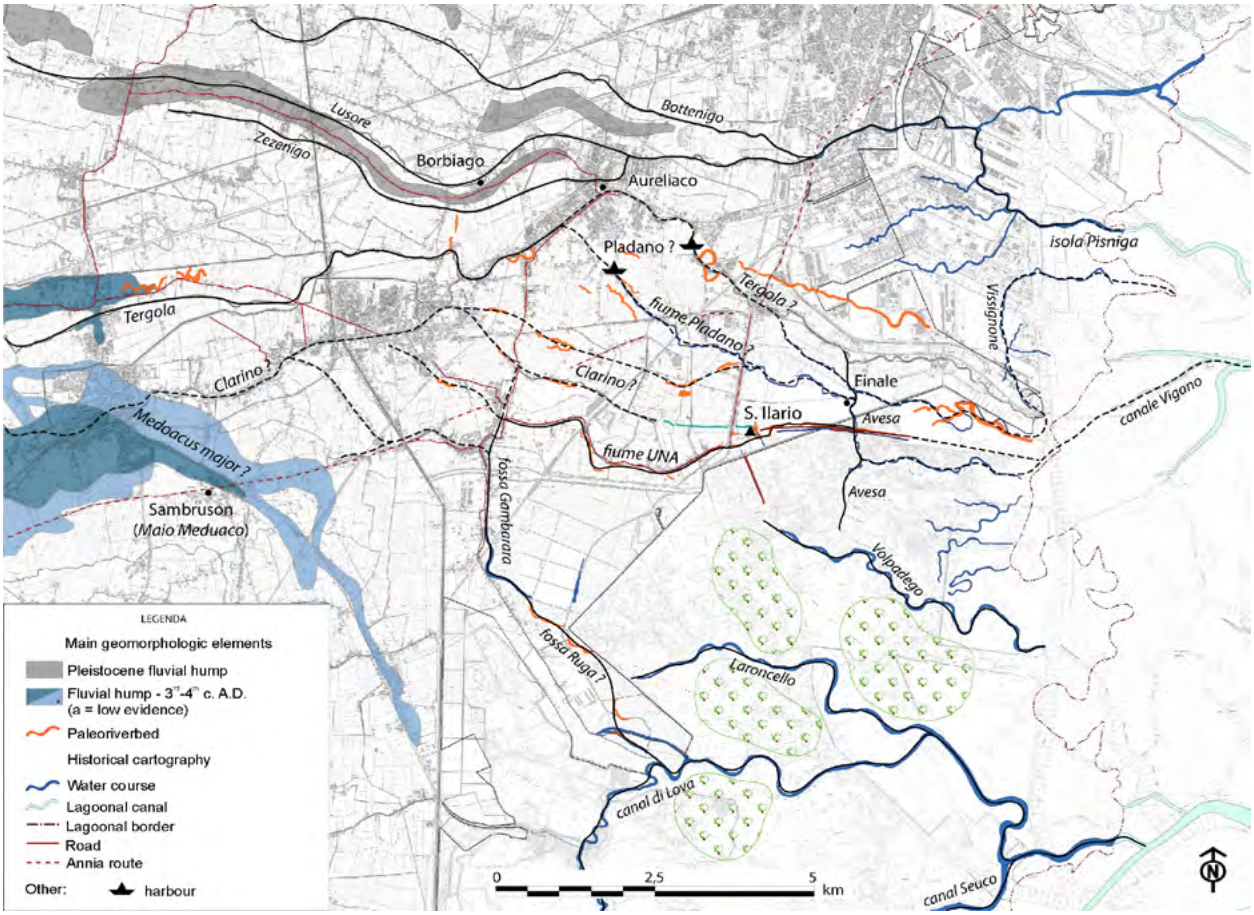

Figure 7. Geomorphologic frame of the area around the monastery of Sant'Ilario: the Early Middle Ages.

Strina 1965: 17-24, Figure 6). The River Tergola was longer and wider than the other watercourses mentioned above, and was probably the major river of this lagoonal sector. It flows from Onara to the northern countryside of Padua, and at this time, it emerged into the lagoon quite close to Venice. The reconstruction of water routes from the river outlet through wetlands and the lagoon has been based on 16th century cartography (for es. ASVe, SEA, *Brenta*, dis. 1/a) and 12th century texts, mainly depositions concerning property boundaries (Lanfranchi and Lanfranchi Strina 1965: 59-66). Even considering changes of names and routes, the early medieval connections could be realistically reconstructed. From the River Tergola, it was possible to make a passage via fresh water canals towards the Canal of Giudecca, and then to the San Marco basin, in front of the ducal palace. A few pottery finds and radiocarbon dating from the underwater excavations of Fusina I (Bressan and Fozzati 1996; Bressan 1997: 35-36; Calaon 2006: 82-87) could be archaeological evidence of the use of this path during the Early Middle Ages. The importance of this river in the monastic economy is underlined by its centrality in the archival sources. From its acquisition, until the 11th century, particular attention was paid to the harbour of Pladano, and less attention to others (Lanfranchi and Lanfranchi Strina 1965: 32-35, Figure 7). Moreover, monastic interest seems to have been focused within the principal estate, coherently organized from a territorial point of view: land properties outside of it were poorly attested (Corrò, Moine and Primon 2015: 32).

The River Tergola was not a connection between two cities, but between the countryside of Padua and Venice. Moreover, a road near the main settlement of Pladano, probably a part of the Annia route, was always mentioned in the description of monastic boundaries. Thus, we may assume that the strategic importance of the area resided in its natural resources, as well its position of intersection between different ways of moving people and goods.

C.M.

The arrival of the River Brenta

The arrival of the River Brenta in this area is not clearly described by medieval chronicles and other written records of the period (Cornaro 1919, 2, IV: 122-123; Lanfranchi and Lanfranchi Strina 1965: 74-75). Traditionally it is believed that it was due to an

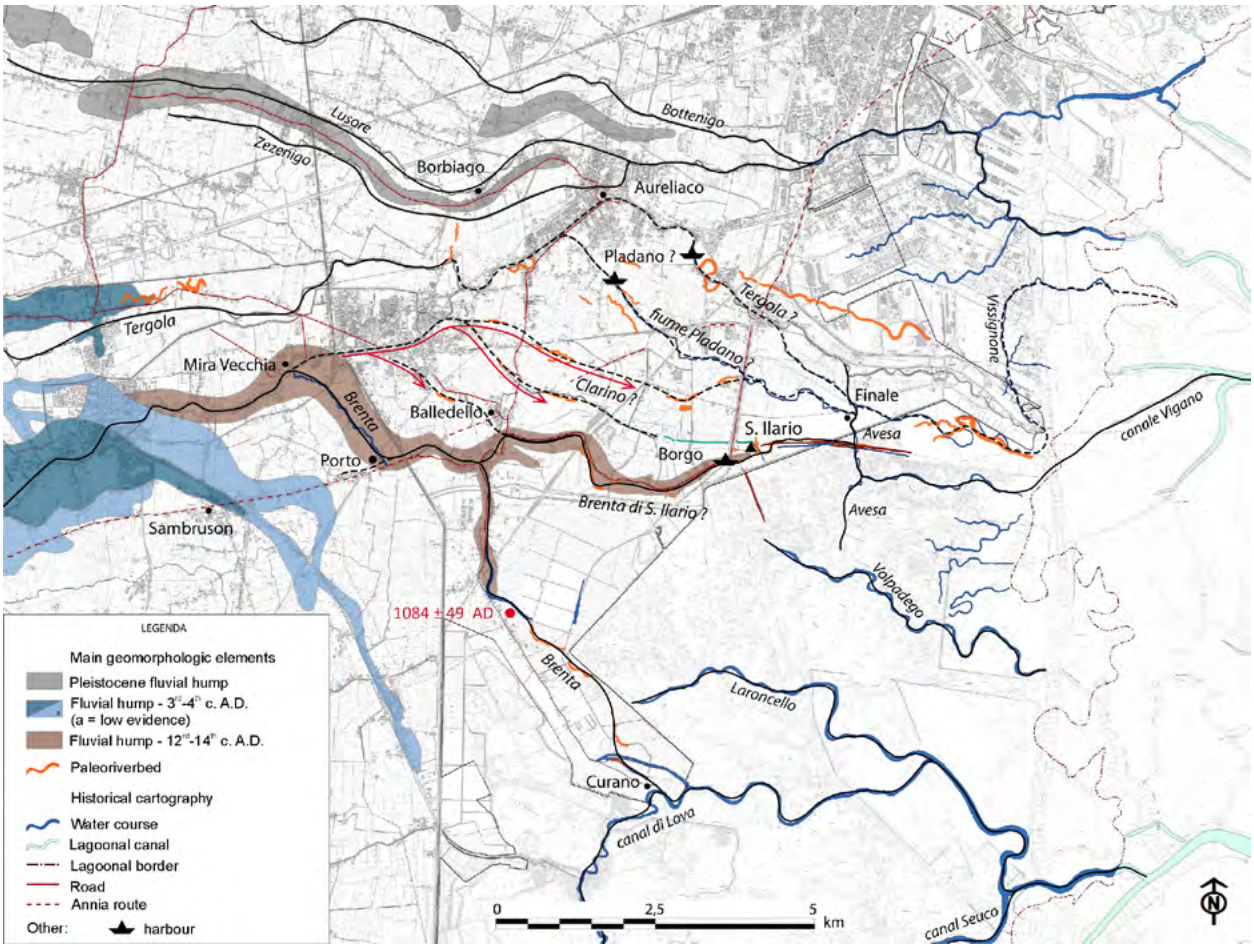

Figure 8. Geomorphologic frame of the area around the monastery of Sant'Ilario after the arrival of Brenta River.

artificial diversion of a branch of this river, made by Paduans. The aim of this operation is still discussed: was it military strategy against Venice? Was the degradation of environment collateral damage, and perhaps, an unexpected consequence? Or was it a natural diversion, subsequently exploited by man (Favero 1989; Temanza 1776)?

Certainly, the diversion of the River Brenta triggered a situation of hydrological instability, which permanently changed the appearance and the function of this area. Evidence of this phenomenon is clearly recognizable on the ground, as a sequence of fluvial ridges that progressively marked the move of the river's course to its present position (Figure 4). As we mentioned above, the River Brenta is characterized by a significant deposition of sediment that clearly identifies its course. The branch of the river that first arrived in this area probably occupied the river beds of existing watercourses. It is recognizable in an embankment, beside the site of Sant'Ilario (Figure 8). This is the only sedimentary unit for which a radiocarbon dating is available, indicating the activation of the river branch slightly later than 1084 (Bondesan *et al.* 2008b; Figure 2 and Figure 9). The arrival of this river significantly changed the features of the landscape and the strategies of its exploitation. First of all, as an immediate consequence, it probably caused an impressive flood, with severe damage to monastic land properties. The new river interrupted the courses of other waterways and opened a new navigable route. Indeed, it directly connected Sant'Ilario to Noventa, close to Padua, opening an important commercial water route. It is well documented that in the 12th century boats travelled from Noventa to a 'river bank' in the monastic area, perhaps an embankment, built to protect land and other rivers from the water and sediment of the River Brenta. There, ships were transported across an earthwork, presumably hauled up to another adjacent water course, which allowed a faster route to Venice than sailing along the Brenta. This passage guaranteed a profit to Sant'Ilario, since the abbot collected tolls from sailors in Borgo, a village close to the monastery.

Traditionally, the diversion of the River Brenta is dated to 1144/1146, when the Paduans granted significant compensation to Sant'Ilario, following a peace treaty with Venice (Lanfranchi and Lanfranchi Strina 1965: 75-77). However, the radiocarbon dating (see above) and some clues from written records suggest that

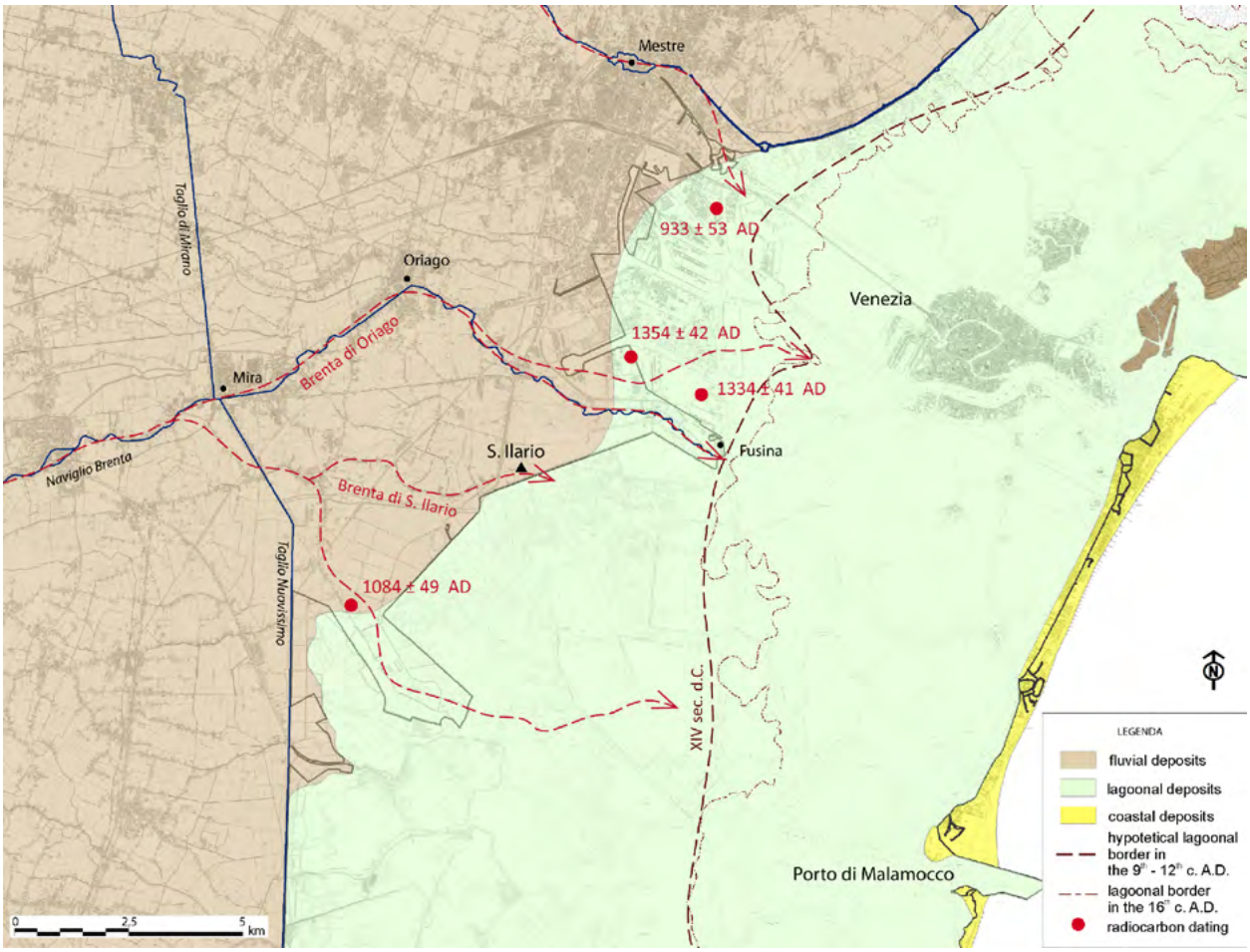

Figure. 9. Paleoenvironmental reconstruction: the arrival of Brenta River.

hydrographical changes may have occurred before that period. They are summarised in the list below:

- After 1110, the descriptions of monastic boundaries in archive sources change, but despite their extension they seem to have remained stable. Starting from this time, the landscape was described using elements, also adopted in the subsequent documents, different from the early medieval charters. For instance, the River Tergola, which marked the northern boundary from the 9th century, is no longer mentioned under its own name. On the contrary, it is described with a circumlocution, as 'the river which flows along the *villae* of *Ceresaria* and *Pladano*' (Lanfranchi and Lanfranchi Strina 1965: 55-58).
- From 1110, there are also significant changes in fluvial harbours. The harbour of Pladano completely lost the centrality from which it benefited in previous centuries. Moreover, a new harbour appeared near (*iuxta*) the monastery. It is highly probable that this is the location where boats crossed the river bank, after paying a toll. In other words, it was a crucial transfer point to a faster route to Venice. In effect, the first time a new river course was mentioned was in 1144/1146, when the 'river of Sant'Ilario' appeared. However, depositions of witnesses seemed to have described a consolidated situation.
- An undated document, usually considered to have been written in 1174, indicates that a water route between Noventa and Sant'Ilario already existed 40 years earlier (presumably in the 30s, Lanfranchi and Lanfranchi Strina 1965: 84)). Furthermore, in the 30s, when Ugerio was the abbot, it testifies to a redefinition of boundary signs, as if changes in landscape could have influenced the arrangement of properties (Lanfranchi and Lanfranchi Strina 1965: 80).
- Finally, a collection of depositions concerning boundaries dating back to the second half of the 12th century is particularly remarkable (Lanfranchi and Lanfranchi Strina 1965: 90-96). They were written when the landscape had already been transformed by significant environmental changes. Present and past were compared, and the last moment of stability was identified in the time of the abbot Peter, who ruled the monastery

at the end of the 11th century (Lanfranchi and Lanfranchi Strina 1965: 49-51).

- The beginning of the 12th century is confirmed as a period of important hydrological events by the disappearance of Malamocco, one of the early significant Medieval settlements of the lagoon of Venice. It was somewhere in the southern lagoon, but the exact location of the site is still unknown. Medieval texts tell that the ancient Malamocco was submerged, but the circumstances of this phenomenon have legendary characteristics (a flood? a storm?). However, between 1109 and 1110 the inhabitants and religious institutions of Malamocco moved to other sites (Corner 1749, 5: 107; Corner 1749, 3: 192; Mazzucco 1983: 43; Spinelli 1987; Vanzan Marchini 2004: 28-30), as if they were forced to do so by a single critical event.

The arrival of the River Brenta would have been a complex phenomenon: for instance an overwhelming flood occupying an existing river bed. Subsequently, natural and human actions could have achieved brief moments of stability. As we have mentioned, the river interrupted other watercourses: moreover, its features and its sedimentations progressively obstructed river beds, creating swamplands. Environmental changes within the monastic estate followed through written records are concentrated between the 30s and 70s of the 12th century. Already in 1170 large marshes were replacing settlements and forests, and memories of early medieval water routes had become confused (Lanfranchi and Lanfranchi Strina 1965: 90-96).

C.M.

A strategic position

The territory of Sant'Ilario was no longer a stable area; however, the importance of its new strategic position in a new river network was probably immediately recognised by the monks. They supervised the water routes to the lagoon, controlling religious institutions on the edge of salt waters. In the south, San Leonardo stood on the water routes to the sea harbour of Malamocco; while in the north, San Leone controlled the passage to Venice (Borsari 1978: 55; Fersuoch 1995). The latter was probably the shortest route from Padua to Venice. In the second half of the 12th century, excavations commissioned by the abbot are documented by written records. It may be assumed that they were devoted to the cutting of a canal, still detectable in a huge embankment in the eastern area of the monastery and in 16th century historical

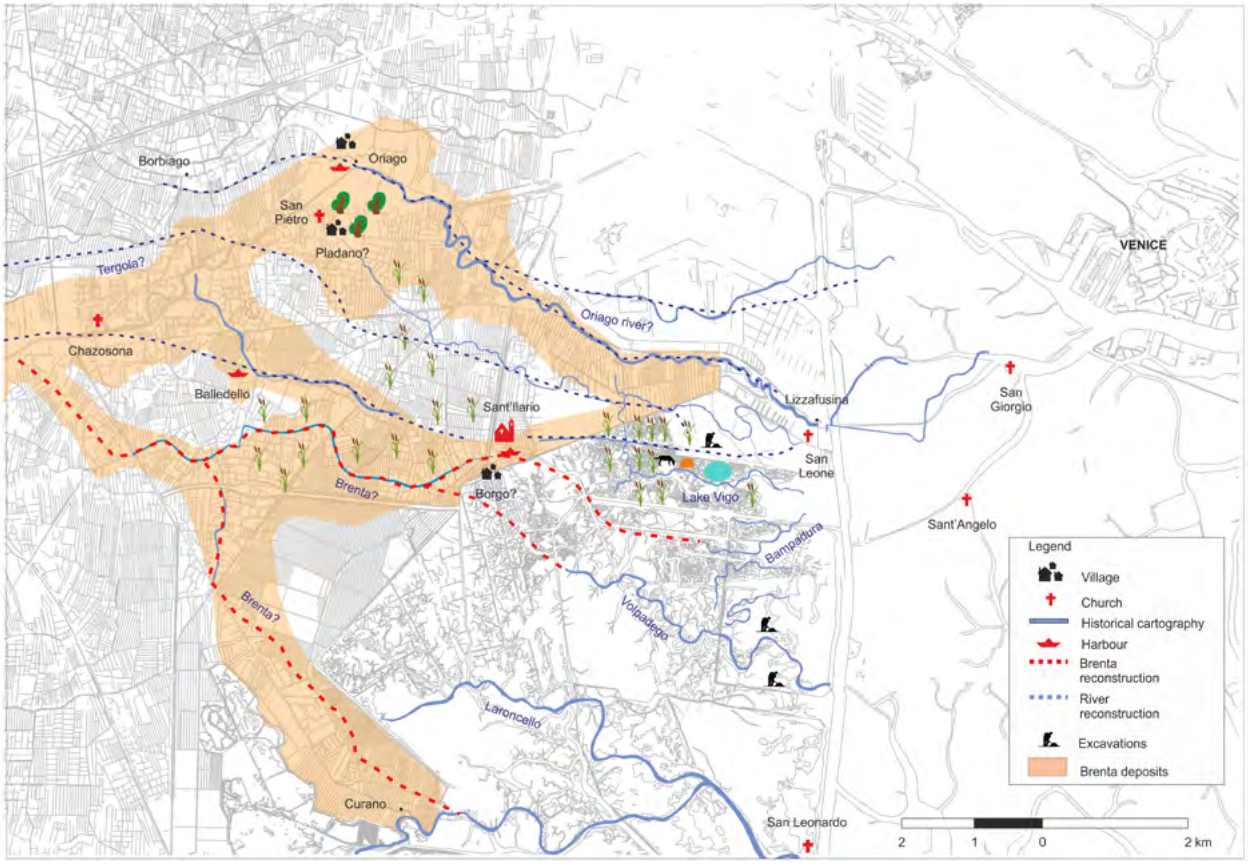

Figure. 10. Scheme of land exploitation between the late 12th and the early 13th century.

cartography. Furthermore, the cutting of other canals by the monks of Sant'Ilario attested to the importance of water routes in monastic policy (Lanfranchi and Lanfranchi Strina 1965: 90-96, Figure 10).

However, in a long-term perspective, the diversion of the Brenta triggered a permanent situation of hydrological instability. Firstly, sand transported by the Brenta progressively obstructed river beds, and between 1150 and 1220 many villages and forests were replaced by wetlands.

E.C.

Political and environmental crisis: the late middle ages

The environment was changing fast, as was the potential of land exploitation. Indeed, in the early 13th century, part of the monastic community started to live in San Gregorio of Venice, probably attracted by the new opportunities of a real Medieval metropolis. Following the 12th century documentation about monastic properties in Venice, we can assume that land had been reclaimed in their urban properties: a lake and a salt works had progressively been replaced by houses and streets (Lanfranchi and Lanfranchi Strina 1965).

However, the abbot and a group of monks inhabited Sant'Ilario and they managed the harbour of Borgo until the 1225. The effort to maintain the supervision on water routes toward the lagoon are evident in the control of religious institution in the mouths of canals, such as San Leonardo or San Leone (Fersuoch 1995, Figure 10).

Between the end of the 11th and the early 13th centuries, Sant'Ilario was also involved in the political problems of Venice. Its territory was challenged by Treviso and Padua, and the monastery and its community were directly threatened by military action. Two events are particularly noteworthy: the troops of Jacopo da Sant'Andrea directly attacked the monks, claiming its property. Furthermore, a few decades later, soldiers of Ezzelino da Romano seem to have occupied the monastic buildings, damaging and militarizing them. It is reported that troops of this warlord fortified the monastery, perhaps building a tower (Dandolo 1943: 302); they were probably taking advantage of the strategic position of Sant'Ilario to control water routes, and making naval incursions into Venetian lands (Dandolo 1943: 302). Written sources are not clear about the fate of the monastic buildings, and archaeological excavations have not produced any clear evidence. However, after these episodes, the monastic

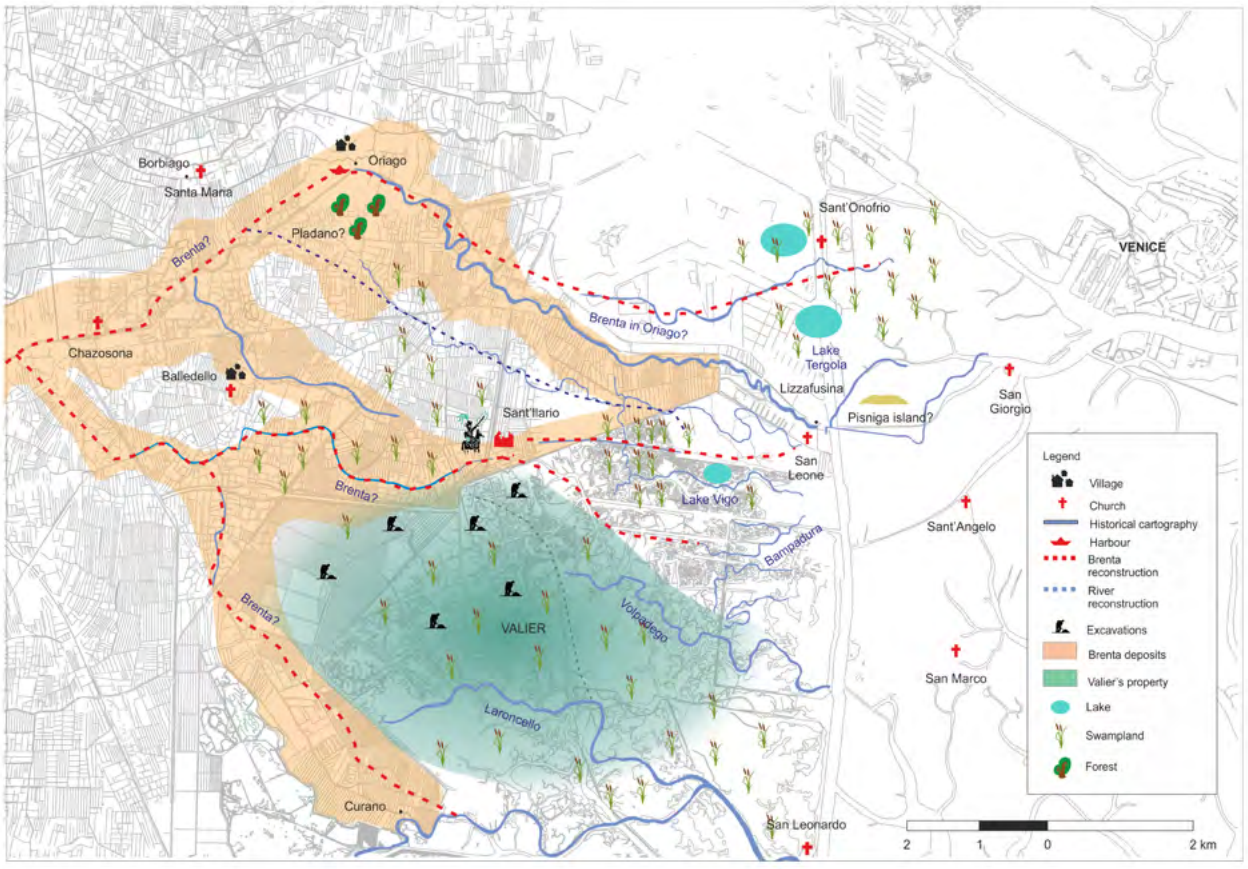

Figure 11. Scheme of land exploitation in the 13th century.

community abandoned Sant'Ilario permanently, and definitively moved to San Gregorio in Venice (Corner, 9: 391). The surroundings of the ancient monastery were rented to the local aristocracy. In particular, the Valier family obtained a huge area in the south with the right of reclaiming, excavating new canals, building water mills and, above all, cleaning and reactivating the so-called 'dead canals' (ASVe, b. 40, Mazzo XXXII, n. 2, 1268, 10 gennaio, Figure 11).

At the same time, environmental changes and human intervention in the landscape were quickly modifying both the fluvial network and the exploitation of land. In 1225 the Paduans organized the settlements under their control to maintain the upkeep and cleaning of a 'new canal' which collected the water of the Rivers Brenta and Tergola, as far as the village of Oriago (Gloria 1872, 2, 901: 303). This information attests that at that time the main watercourses of the area passed to the north of the monastic site, more or less corresponding to the present-day Naviglio Brenta up to Oriago. Indirectly, it could be used to propose a chronological determination for the fluvial deposits detected on the ground (Figure 12). This new arrangement entailed two immediate consequences. The early branches of the Brenta in this area were gradually deactivated, with a decrease in their flow rate and a progressive silting up. Thus, the harbour near Sant'Ilario lost its original importance, due both to the activities of the river branch on which it was located and the competition of another harbour, Oriago, which controlled the main water route to Venice. Moreover, the river outlet of the Brenta moved northwards, probably occupying the river outlet of the Bottenigo, and emptying into the lagoon by Venice (Favero, Parolini and Scattolin 1988: 28).

Also within the monastic estate, there are significant clues of major changes in settlements and land exploitation after the departure of the religious community. Already in the second half of the 13th century, the village of Borgo, where once Sant'Ilario collected the toll to Venice, had been abandoned and replaced by marshes (ASVe, b. 40, Mazzo XXXII, no. 2, 1268, 10 gennaio).

In the 14th century, the aspect of the whole territory was completely transformed (Figure 13). The distribution of settlements mentioned in written records reflects the changes in the hydrological network, many of them located along the present Naviglio Brenta or its

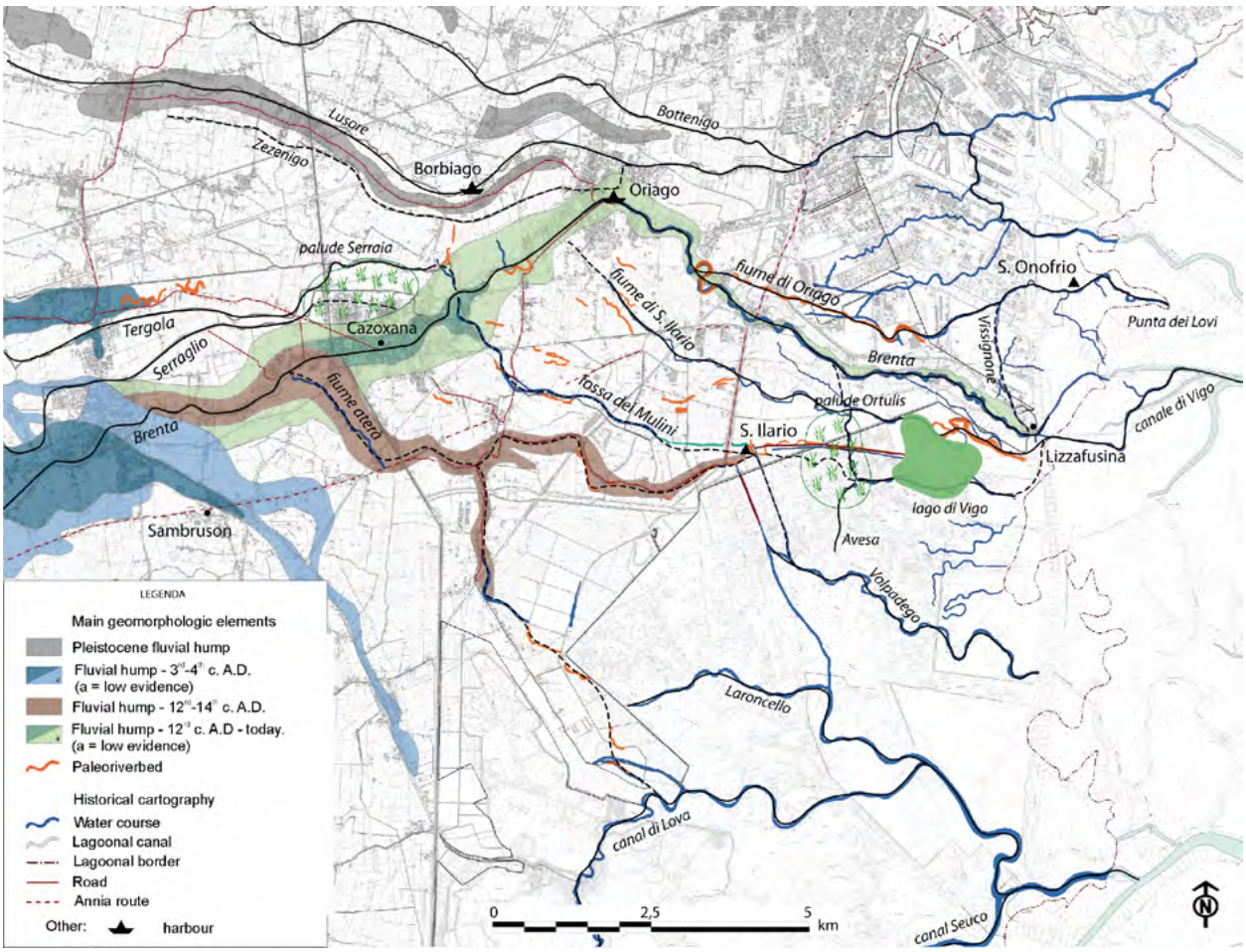

Figure 12. Geomorphologic frame of the area around the monastery of Sant'Ilario: the 'New canal' up to Oriago.

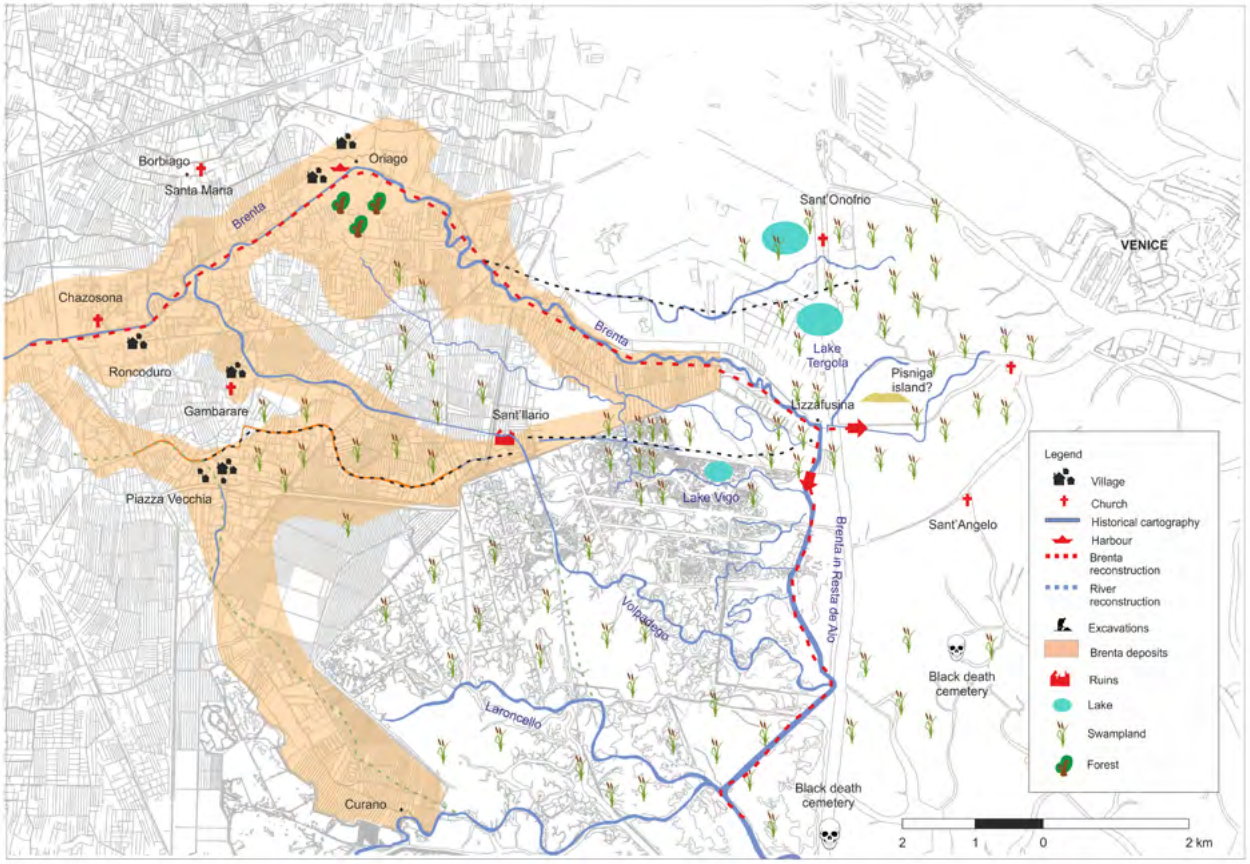

Figure 13. Scheme of land exploitation in the 14th century.

main drainages, such as Gambarare (*La Gambar*), Ronco (*Ronchoduro*) and Mira Vecchia (*La Mirra*, Corner 1749, 9: 399). Moreover, in the first half of the century, the first branch of the Brenta that once connected Sant'Ilario to Venice was already buried. In 1327 it was possible to walk from the monastery to San Leone on the edge of the lagoon on its deactivated river bank; and in 1347 the water route between Mira Vecchia (*La Mira*) and *Torre di Curano* (ASVe, SEA, Brenta, dis. 1) was completely dry, and thus renamed *Brenta Secca* (Verci 1786, no. 1990).

In the same period, the river outlet of Brenta in the lagoon was becoming a serious threat to Venice. The significant deposit of fluvial sediments at the estuary

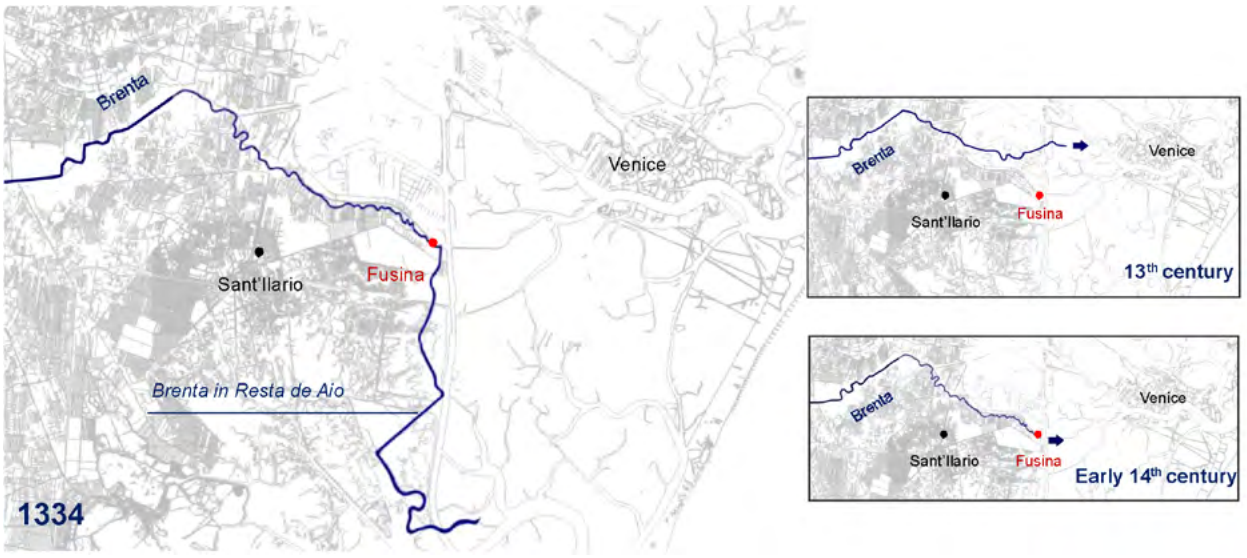

Figure 14. Diversions of the outlet of Brenta River between the 13th and the 14th century.

was rapidly increasing, causing the advance of wetlands toward the city centre and the obstruction of lagoonal canals (Favero, Parolini, and Scattolin 1988: 17). This bought the territory of Sant'Ilario to the attention of the Serenissima once again. This time it was no longer a strategic area that guaranteed control of communications and resources, but a problematic hydrological network to manage, to prevent damage to the city and its sea harbour. To protect Venice, the mouth of the River Brenta was diverted toward Fusina, next to the hospital of San Leone (Figure 14). The solution was inadequate, and about 1324 the 'Cava Nova' was built (Favero, Parolini and Scattolin 1988: 20). This was an artificial river bank, directing the water of the River Brenta to the south, moving fluvial deposits away from the city. This earthwork passed along the medieval lagoonal border, and obviously abruptly interrupted the original outlets of several watercourses that had flowed into the southern lagoon. Thus, an area characterized for centuries by a role of connection between mainland and salt waters was definitively separated from the lagoon.

Consequently, religious institutions which once controlled the main water routes lost their primary function, and were surrounded by marshes. Some, such as San Leone, were finally abandoned and fell into ruin; and others, such as San Marco and San Leonardo, were converted into cemeteries during the Black Death (Fersuoch 1995).

E.C.

The creation of the Palladian landscape

The branch of Brenta retained its function as a significant water route, and became the main axis along which new settlements were distributed. When boats from Padua arrived in Fusina, they were carried over the river bank by machinery, and then sailed to Venice (Foscari 2005a: 36). Furthermore, in this period the principal waterways that led to Sant'Ilario monastery were buried and reduced to roadways, and monastic buildings were completely ruined (Cornaro 1919). Land exploitation was thus completely changed, and new planning solutions were needed. The 15th century had been characterized by the opposing interests of Venice, worried about the floods of the Brenta, and the demands of local population for a stable and exploitable area. At the end of the Middle Ages, the safety of the River Brenta, provided with many fluvial infrastructures, became the main goal of ducal policies in the area. However, the ancient monastic estate, always a marginal and unstable area, was still inhabited and a centre of the interests of the

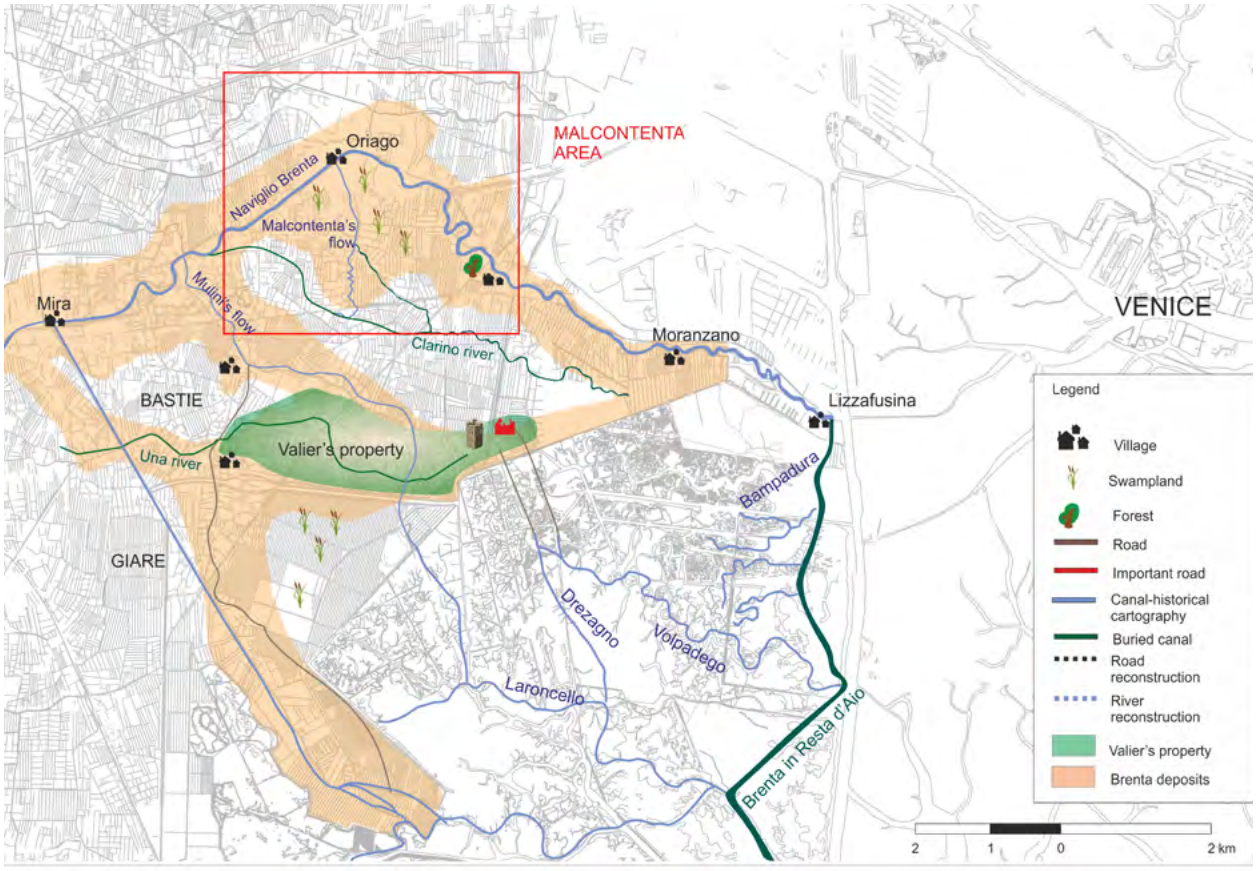

Figure 15. Scheme of land exploitation in the 15th century.

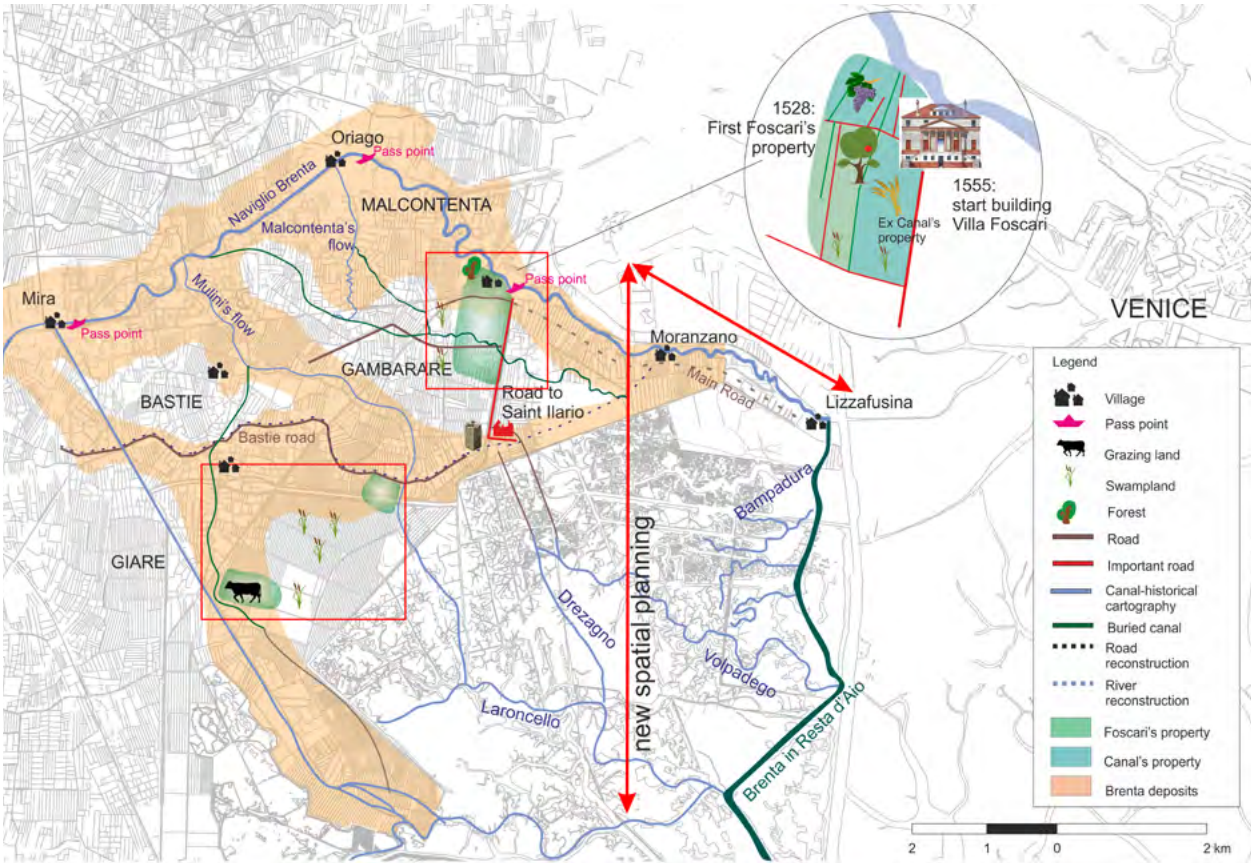

Figure 16. Scheme of land exploitation in the 16th century.

local population. It had been a period of the conflicting priorities of managing the river and protecting the land. For example, in 1430 a canal was cut near Oriago, allowing the waters of the River Brenta to flow to the south (Figure 15). This drainage allowed water to flow directly from the Brenta to the lands of Saint'Ilario, decreasing the flow rate and preventing floods in Oriago and near the river outlet. Unfortunately, it also caused major damage to all the southern land properties. The objections to this hydraulic work by the inhabitants were so vociferous that the new canal, named Fossa dei Malcontenti (literally probably the 'canal of bad containment'), was often interpreted as something like 'river of dissatisfaction' (Zendrini 1811, 1: 91).

In the second half of the 15th century, continual flooding of the Brenta and excavations of new drainage systems had been so numerous to be uncountable and undetectable on the ground, where traces of palaeo-river beds draw an inextricable network. Both natural and artificial events were making property boundaries almost unrecognizable, causing several severe boundary disputes in the area, in particular concerning the Valier family (Foscari F. 2005: 10-12).

A stable property arrangement and a new organization of the landscape was undertaken by the aristocratic Venetian family of Foscari (Foscari F. 2005: 9-16). From the beginning of the 16th century, it promoted a land acquisition policy in the countryside. Their largest estate spread along the River Brenta, with a rich agricultural potential. It was crossed by the so-called 'Main Road', which connected the area of Gambarare with the village of Lizza Fusina (Foscari 2005a: 33). It is interesting to note that it probably retraced the route of the Roman Annia route, almost the only memory of the past organization of the landscape. The route network of the area and its traditional east-west orientation, from the mainland to the lagoon, was completely transformed and adapted to the new focus of the landscape: the villa of the Foscari – La Malcontenta.

Southern areas, in the surroundings of the monastic site, were exploited as pasture, and connected to the north by the '*Strada Granda* to Saint'Ilario', a direct connection to the family mansion in the north (Foscari 2005a: 34-35). This road definitely became one of the main features of the landscape, and is still one of the most important routes of the area today. The land acquisition by the Foscari family was neither easy nor painless. The acquisition of a large area of land by an aristocratic Venetian group inevitably collided with the interests of many local families. The local nobility had controlled the area since the 14th century, and

their properties were small and fragmented, but well-established. The opposition of the Da Canal family to the Foscari is a good example of the conflicting interests in action (Foscari 2005a: 36-38). The small local family tried to preserve its land tenure. For instance, initially the Da Canals sold just poor quality land, mainly marshes, and built a new road to mark the boundaries of their land. Only later did they allow free passage to the Foscari family, but retained ownership of the area. The expansion of the Foscari property continued until 1535, when the family purchased agricultural land located in a swale area, called 'Giare', which was quickly converted into rough grazing (Foscari 2005b: 27, Figure 16). The new economic importance of the area and the beauty of its landscape played a decisive role in the setting of the Palladian Villa of Foscari, La Malcontenta. It was built on a very beautiful meander of the River Brenta. Furthermore, it was also next to a *passo a barca*[2] of the river controlled by the same aristocratic family. In other words, the Foscari transformed the territory of Sant'Ilario into a real Palladian landscape, where an amazing panorama was created, in conjunction with various land exploitation and water management schemes. Once again, the area became an important economic centre, characterized by a control point, the Villa Foscari, and careful attention to water routes toward Venice. However, human and natural events have completely redrawn the arrangement and features of the area, and its Medieval organization is now almost unrecognizable.

E.C.

Conclusions

In conclusion, some additional remarks on the history of this landscape are appropriate. In the Early Middle Ages the monastery was founded in a strategic area: it was at the centre of an intersection, rich in exploitation possibilities, and already characterized by ducal properties, such as the chapel.

The arrival of the River Brenta in the 12th century represented a turning point in landscape dynamics, with conflicting effects on its exploitation. Initially, after the flood and the related damage, the monastery took advantage of its new position on the main waterway to Venice. However, this situation did not last long.

The environment become extremely unstable, on dry land as well in the nearest lagoon; and land reclamation, drainage, canals and infilled waterways radically altered the appearance and function of the area, which became the scene of conflicting interests of local communities and Venetian central power.

[2] A *passo a barca* is a ferry across a river, using a boat which crosses between docks on either bank.

While this territory was only a marginal and problematic countryside, it gained the attention of Venice when hydrological works on the River Brenta became necessary to protect the city and its main sea harbour. Meanwhile, the inhabitants continued to reclaim and modify land and rivers to maximize its exploitation, creating the conditions for the development of the Renaissance Palladian landscape.

In our view, the hydrological system of the area was the foundation of the economy and settlements, in the past as it is today. At the present day, the works at harbour mouths have increased the volume and velocity of flow of sea-water in the lagoon. Finally, the infrastructure of the petrochemical plants of Marghera has seriously modified the hydrological balance of the lagoonal basin.

The features of the present environmental instability are very different: while in the Middle Ages and from the 15th to 20th centuries the main problem concerned fluvial deposits, today the Venetian lagoon is gradually becoming fully maritime. However, in both cases we cannot understand this transformation without the analysis of the history of the landscape and its exploitation.

E.C., C.M., S.P.

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Abbreviations

ASVe = Archivio di Stato di Venezia
dis. = disegno
SEA = Savi ed Esecutori alle Acque

Settlement dynamics in the rural Bolognese area between the Late Middle Ages and the Modern Era

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Abstract

The crisis of the 14th century seems to represent a critical point for the development of late medieval society. In fact, during this crisis a series of economic and demographic dynamics that characterized the Communal age was dramatically interrupted. This is a conjuncture that had a heavy impact on the countryside, affecting especially the settlements developed outside the communal control, but not only them. After the great consideration given to the problem of castles, archaeology has devoted less and less attention to these subjects, and in particular to the settlement system, so that historians have taken on a predominant role in this field. The fieldworks carried out extensively in the Bologna landscape, allowed to collect a big amount of data related to the features of the rural population. On the basis of all these information, it is now possible to attempt a synthesis of the settlement dynamics during the late medieval period. In the countryside, changes not only for settlements, but in general for society, are expressed by different events, ranging from the structural characteristics of buildings to the features of consumption and of material culture. In particular for this last aspect, the changes seem to move towards a growing 'ruralization' of ceramic items.

Keywords: Rural settlement, 14th century crisis, villages, social identity, material culture

Premise

The present work describes an archaeological survey of the rural population and the impact of the transformations that it underwent during the centuries of the late Middle Ages and Modern Era. The archaeological interpretive framework that we aim to provide will be as analytical as possible, and our data will be limited to the plain of the province of Bologna, except for several excursions a few km from its borders in various directions, especially westwards (Figure 1).[3] For our reading, we rely on a re-elaboration of the data provided by archaeological excavations and surveys of the Bolognese plain over the past thirty years (Gelichi, Librenti and Negrelli 2005: 53-55). This territorial restriction is due to the fact that systematic recognition campaigns carried out in neighbouring territories, i.e. in the area of Modena (Atlante 2003-9, I, III) allows only a rather uncertain reading of the settlements in the Late Middle Ages and the Modern Era.

Scholars appear to have focussed their attention on macroscopic aspects such as fortified sites. However, in the case of rural constructions – especially from the late Middle Ages and the Modern Era – only a few records remain, and prove hard to interpret within a unified framework. On a larger scale, even in the exceptional cases in which regions paid commendable attention to abandoned villages (Panero and Pinto 2012; Milanese 2006; Valenti 2004) – a seminal theme in Italian Medieval archaeology – the research was not extended to other specific features of Late Medieval settlements.[4] The rural population was a determining feature of the new forms of settlement that characterised the socio-economic structures of the emerging political entities during the Modern Era. However, our knowledge of these centuries appear to rely entirely on archival sources which, while indisputably numerous, do not provide us with much systematic information on settlement dynamics.

Going back to the territory under examination, we can see that even the tutelage of these constructions – an extremely vast building heritage until a few decades ago and held in high regard by cultural institutions up to the 1970s (Carta Generale 1977) – has left no

[3] The area was selected because the surveys conducted on the plain are far more readable than in the hills and mountains. The territorial limit set by the present work is a hypothetical line running from the northern borders of the province to a point located a few km south of Via Emilia. Archaeological data about this area, covering several hundreds of square km, vary considerably depending on the kind of investigation carried out in the zones that compose it. Most of the identified sites are indicated in Librenti and Zanarini 1991, and in the archaeological risk map of the individual municipalities. We did not include the area of Imola, despite its significant role in the Bolognese territory during the Middle Ages, because of the lack of information available about the centuries under examination.

[4] The question of the population in scattered rural buildings, despite being among the most characteristic features of rural settlements in the plain, has remained virtually ignored. One of the pioneering works on the theme is that of Scarlino 1985. Nor should we forget that the 7th volume of *Archeologia Medievale* 1980 was titled *Per una storia delle dimore rurali* (a history of rural dwellings) and pinpointed a series of social problems of the history and archaeology of rural constructions. These questions remain topical to this day.

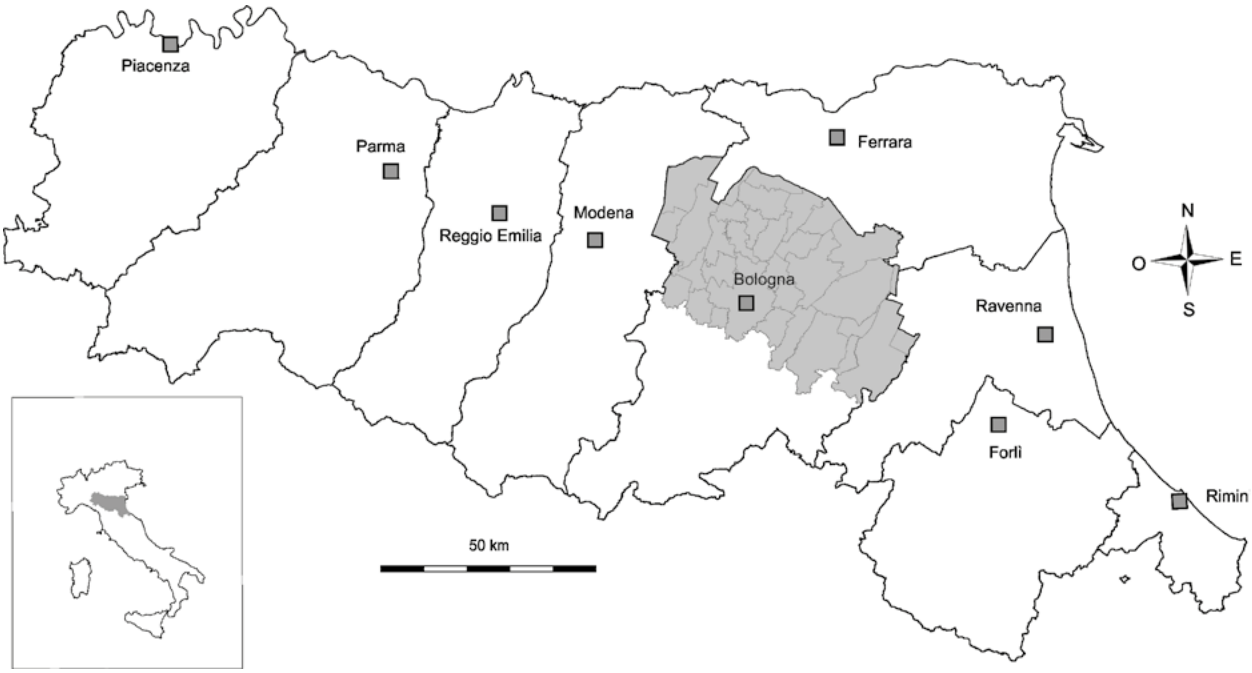

Figure 1. Study area: lower plain of Bologna, Italy.

relevant archaeological traces. The various building regulations on rural constructions itemised in urban plans never considered this particular aspect (Stagno 2014 and 2015). Another contributing factor was the persistent belief that the preserved structures – several hundreds of buildings until a few decades ago, now almost completely gone – could be read only in a typological-functional key, consistent with the best tradition of post-war geography (Gambi 1976; Ortolani 1953; Savini 1999). These sites were therefore granted only a mere semblance of tutelage, without ever achieving a status of archaeological dignity. They were excluded from archaeological cartography, and for a long time so were the villages and even the castles. This exclusion seriously limited our knowledge of the topic, evening out the evidence and the issues related to it.

Let us stress beforehand that we do not consider the area under examination as historically homogeneous, but rather as a palimpsest of territories that took form through documented settlement dynamics. The analysis of archival and cartographical sources shows that numerous territories were only recently incorporated in the Commune of Bologna. We therefore believe that the results of the surveys should not be read as a local adaptation to more general phenomena.

The aim of the present work is to achieve an interpretation based on the settlement models – sometimes both distinct and coeval – that emerged from the land management policies implemented by a close succession of political and social actors.

Between the 10th and 15th centuries, the Bolognese territory underwent a series of political and social transformations. These transformations were highlighted by historiographers, albeit with varying attention depending on the field of investigation. The determining factor was necessarily the impact of these choices on the cities – a phenomenon documented since the 13th century with the development of urban districts with their extra-urban extensions (Greci 2007). The emergence of urban control as a determining feature of the new territorial configuration notoriously clashed with what remained of the territorial *signorie*, which were the first to suffer from the consequences of the new hegemony. An illustration thereof is the visible decline in the vitality of the castles controlled by the *signorie*: already in the 13th century, these castles were mostly abandoned as their inhabitants moved to new locations such as *liberi burgi* (Comba *et al.* 2002).

In this dynamic framework, the rural population was the object of sector studies that focussed on specific themes such as the estates of the Church or of the *signories* and the farming collectives known as *partecipanze* (Partecipanze 1990). However, until the end of the Middle Ages, only in a few cases can we perceive the actual impact of public or private policies on territorial settlements. A territory as vast as the Bolognese one, as we shall see, was radically transformed over a few decades, leading to disparate situations that ranged from the complete ruralisation of several settlements to the persistence of population centres founded in the Early Middle Ages.

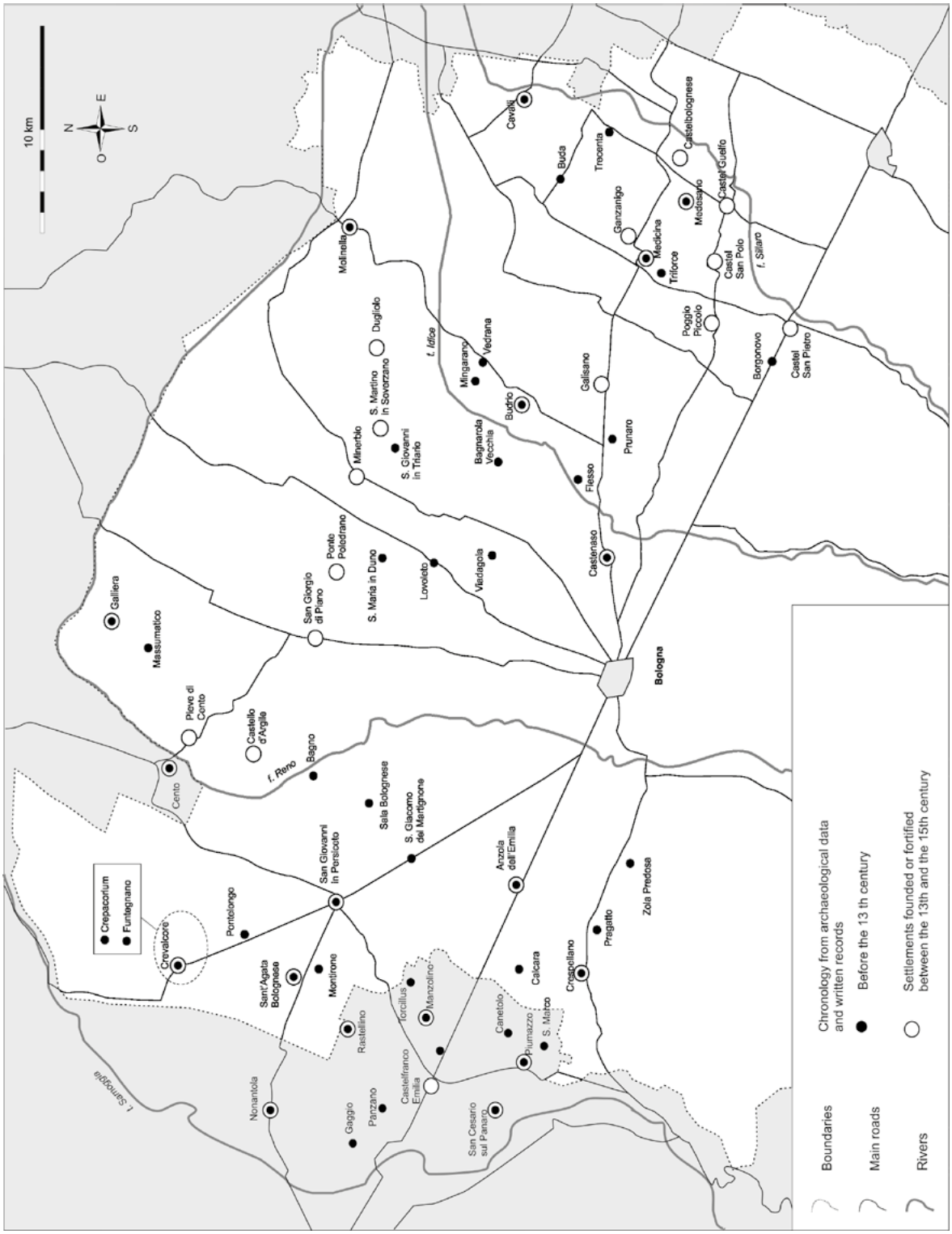

Figure 2. Fortified settlements in the study area (data from written and archaeological records).

We can consider this 'historical landscape' as the result of the choices made by various figures, i.e. as the tangible fruit of the thoughts expressed by the *signories* as well as by rural communities. The question is especially relevant during the centuries of the Late Middle Ages, when the territory became a palimpsest of different models offering remarkable opportunities for comparison between the data of archival sources and those of archaeological surveys.

The crisis of the 14th century led to the dismantlement of the Commune's political project and paved the way to unprecedented scenarios (Dondarini 2007; Trombetti Budriesi 2007: 799-804). Despite its catastrophic effects, this new phase also brought a series of positive consequences (Molinari 2016: 9). The demographic contraction, for instance, opened up unexpected opportunities for a sector of the population that existed outside of fixed social roles (Bergdolt 1997: 303-329), leading to an upheaval of social dynamics. However, whereas this issue was extensively debated by historians and demographers, it does not appear to have informed the results of archaeological investigations (Molinari 2016), at least in the Italian context.

Let us also consider an additional aspect, namely that of written sources, often regarded as alternative to archaeological ones. A brief overview of the existing publications on local history, including a few rather good analytical contributions, shows that these results would be quite difficult to integrate with archaeological ones. In the present work, we therefore preferred to make a targeted use of archival documents and to select only the more systematic ones. In this respect, a particularly relevant case is that of the survey included in the *Descriptio* commissioned by Anglic in 1371 (Cinti 1990; Dondarini 1990): the survey systematically describes a series of features of the territory's settlements and demographics and lends itself particularly well to a comparison with archaeological sources. It is worth remembering that this source originally had a fiscal purpose but that historians eventually concluded, after a rather long controversy, that it is also essentially reliable as a demographic survey (Dondarini 1990: 17-44).

Continuity and dynamics of the settlements

The numerous fortified settlements established in the Bolognese territory at the end of the Early Middle Ages met with very different fortunes, although their trajectories can be summarised in two physiological directions, namely their involution and disappearance on the one hand or their revitalisation on the other. What interests us here are the modes and characteristics of these trajectories, insofar as they coexisted with the emergence of new – and typologically different – population centres, either fortified or open. In particular, the new *liberi burgi* also contributed to the depopulation of the Early Medieval *castra*, following a strategy of territorial control that is well documented in historical sources, as for the case of Castel San Polo (Librenti and Zanarini 1991: 74-77). We can rely on various data of different nature – mostly archival, but also exclusively archaeological ones – that outline a picture, or should we call it a background, from which we can begin to reflect upon the transformation of rural areas (Figure 2) (Foschi 2012).

A substantial part of the sites that were founded during the Early Middle Ages probably eludes our reading, as any trace of their existence has since then been cancelled by the urban development of the Modern Era.

From zone to zone, the number of archaeologically attested Early Medieval *castra* variously exceeds or is inferior to the number of historically attested ones. Both archival and archaeological sources tend to identify these settlements with a recurring model, i.e. a rectangular perimeter enclosing an area of 1 to 1.5 hectares.[5] However, the existence of smaller *castra* cannot be excluded. The results of the excavations indicate an economy that relied heavily on manufacture and on the control of the waterways, as the case of *Pontelongo* near Sant'Agata Bolognese (Gelichi and Librenti 2014). There are no reasons to believe that the fortified sites on the plain had a different configuration, given the strongly homogeneous culture suggested by surface surveys. The great amount of spindles and ironwork, along with the massive imports of soapstone containers, the millstones in the Alpine region and even the glass linen-smoothers from continental Europe suggest that these villages must have been significant economic centres.

However, if we move our attention to typically rural settlements from the Early Middle Ages, the data available become quite patchy and suggest a strong lack of territorial homogeneity. On this subject, it is worth noting that a few regional surveys have recently reconstructed a situation in the Early Middle Ages that is quite different from what was known so far. The research conducted on the territories of Cesena (Negrelli 2008) and Saltopiano in the Bolognese area, which belonged to the Ravenna Archdiocese during the Early Middle Ages (Cianciosi 2011: 31-35; Lazzari 2007: 39-41), indicates the presence of a widespread population in that period, including case of centralisation in the Romagna region (Gelichi and Negrelli 2008: 262-264). The finds suggest the existence of communities enjoyed a rather good level of autonomy (Lazzari 2007: 46-47), as in in the case of Saltopiano, or of land estates. These

[5] The measurements of the surface areas of the sites are based on aerial pictures and essentially match the data provided by Settia, which are based on archival sources (Settia 1984: 221; Settia 1999: 198).

Figure 3. Example of 13th century agricultural parcelization, Medesano, Castel Guelfo.

features are quite different from what we find in other parts of the Bolognese and Modenese areas, both before and during the establishment of castles.

Regarding the Central and Late Middle Ages, the numerous finds from surface surveys are generally quite difficult to read from an analytical standpoint. Many of the recently documented areas were investigated only for archaeological risk assessment purposes and not to carry out a diachronic study of the population. In order to be used in research, these data would therefore require more in-depth investigations. They can nevertheless help us elucidate, if only partially, some aspects of the evolution of these settlements. Finally, the data provided by excavations and archaeological studies of architectures – the only methods available to reconstruct the building heritage of the Late Middle Ages and beyond – are quite inadequate (Librenti 2007).

Let us also point out the importance of the traces left by agrarian fragmentation. Based on topography and geomorphology, the land can be systematically divided between the ancient soils that were settled since the Antiquity and the Post-Roman alluvial deposit. The latter, whose previous borders had been erased, appeared to welcome a more innovative kind of population. The persistence of Roman centuriations bears the trace of centuries-old interventions aimed at maintaining the water supply and road network. In the lands that were flooded after the Antiquity, the main interventions on the farming system aimed to achieve an optimal exploitation of the paelochannels by dividing the land into parcels. These parcels constitute the first topographical indicator of the new forms of agricultural exploitation that emerged in the 13th century.

It is worth noting that the two most important such operations, the one carried out in the Medesano area[6] (Figure 3) and, outside our field of investigation, that of the Centese farming collective, did not start as settlement areas. In the 13th century, when the land was subdivided into contiguous parcels, the Medesano area (Librenti and Molinari 2003: 115-118) did not feature any rural structures or castles. The first traces of population in those areas date from the second half of the 13th century – more than half a century after the land subdivision process. Finally, the first two 'castles' (Figure 4) did not appear until the beginning of the 14th century. These fortified strongholds, equipped with trenches and ramparts (Librenti, Michelini and Molinari 2004: 42-43), were established by the Pepoli family, from Bologna, with the support of the Commune. The family appeared to control a large property with military features.[7]

[6] The reconstruction of the original land parcellation can be found in Zanarini 2000, Table 1.

[7] In the Medesano area, in 1309, the Pepoli family built a system of fortifications to protect Bolognese properties, of which a few traces remain in the site of Castelbolognese (Zanarini 2010: 25-28, figures 3-4).

Figure 4. Fortified settlement *Castelbolognese*, Medesano, Castel Guelfo (from aerial photography).

New settlement models

The dismantlement or transformation, mostly by the hand of the Commune of Bologna, of the fortified settlements of the *signorie*, proved decisive for the establishment of new structures. Archival sources testify to frequent demographic transmigrations between the old castles and *liberi burgi* (Rinaldi 2007: 424), although some of those *liberi burgi*, such as S. Polo, did not meet with better fortune. Let us mention the census of cardinal Anglic, which effectively mapped *a posteriori* how the population was redistributed after the plague. The Commune of Bologna gradually invested important resources to ensure the protection of some of these centres. As Anglic's census indicated in 1371, such centres were limited in number and mostly concentrated on the western borders of the territory. Similar interventions, including the establishment *ex novo* of several fortified strongholds, continued until the late 14th and 15th centuries (Foschi 2012; Zanarini 2006). The fate of the new settlements established in the Late Middle Ages – including, beside the castles, several villages born outside of any public agenda – did not escape the dynamics previously observed for the Early Middle Ages, and cases of development and crisis of population centres are documented well into to the 14th century. The 14th-century crisis of the settlements touched an important part of Europe (Rapetti 2006: 30-31) and should also be linked to the slow transformation of rural settlements (Librenti 2016), rather than to the economic crisis alone.[8]

Thanks to the integration of archaeological sources, a comparison with the two previous centuries allows us to outline the redistribution of the population in a few sectors of the territory (Figure 5).

The population appears to have gathered in the castles that belonged to the Commune, even if protected only by trenches and fences, or to be scattered across the various rural communities (Foschi 2012). There is significant documentary evidence testifying to the depopulation of several fortified sites that we know to have been populated in the previous centuries. Archaeological examinations of Early Medieval *castra*, although mostly based on surface surveys and aerial

[8] Regarding the debate on the problems of the fourteenth century, we recall the recent edition of volume XLIII of Medieval Archaeology, which includes a monograph entitled 'La congiuntura del Trecento' edited by Alessandra Molinari.

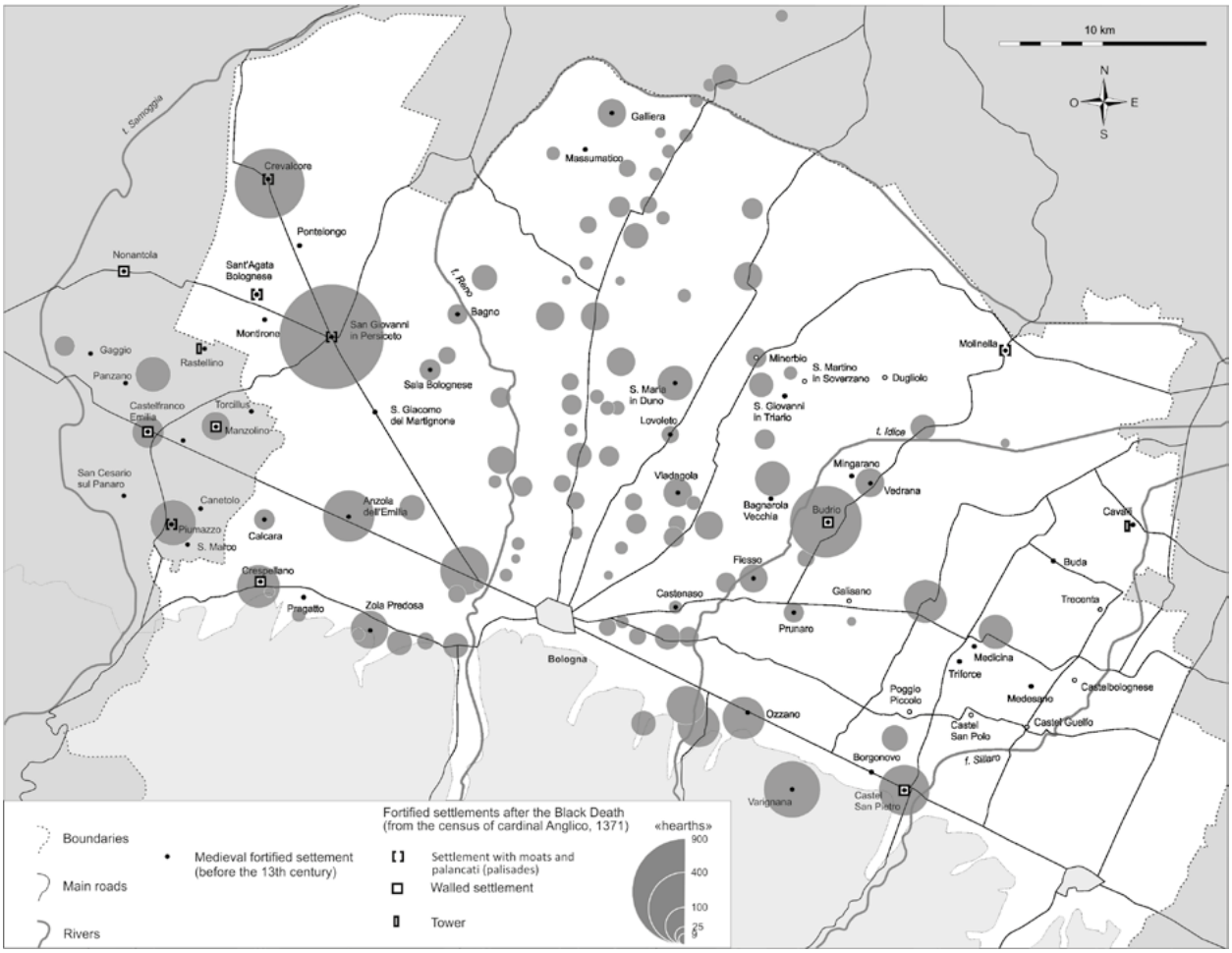

Figure 5. Transformations in settlements and population after the Black Death / Population and fortifications in the census of cardinal Anglic (data from Dondarini 1990, tav. C, p. 99).

photos, are fully compatible with this scenario. A brief review of these archaeological areas may help us understand the extent and character of the problem.

The discontinuous castles of the *signories* present a gap in archaeological finds that indicates that the involution must have taken place by the 13th century. The sites of Bagnarola (Gelichi 1983), *Triforce* (Librenti, Michelini and Molinari 2004: 29-30), Granarolo, and the *montirone* near Sant'Agata Bolognese[9] carry very few traces of human presence in the 14th century. It is therefore impossible to establish any significant presence in those areas during the Late Middle Ages, which might be due in some cases to dispersions from neighbouring buildings.

The new strategies of the Commune led to the political decision of consolidating a number of Early Medieval castles, but following different modes and criteria. For instance, the settlements of Budrio, Medicina, Castel San Pietro and Castelfranco were walled by the 14th century (Foschi 2012), others had to wait until the following century and still others remained surrounded by trenches and fences. The selection was clearly planned and based on a strategy of control that privileged some sites to the detriment of others. Depopulation was encouraged even further by the establishment of brand new settlements such as San Giorgio di Piano, Crevalcore and Argile. Despite their perfunctory fortifications, these sites appeared to have territorial management functions. The *liber burgus* of San Polo, founded by the Bolognese in the early 13th century on a 4-hectare area and divided into countless *casamenti*, fell into disrepair. Perfectly in line with historical sources, the archaeological recognitions of the site found negligible traces of human presence during the second half of the 14th century. The abandonment of Borgo Nuovo was less radical, and archaeological surveys found a greater number of ceramics dating from the late 14th century. The site, documented since the mid 12th century and later fortified by the Commune, had a regular structure whose traces can still be seen in its rural delimitations.[10]

[9] These materials were observed by the author during the surveys.

[10] See the history of the site in Pini 2001, pp. 264-268. For the image of the site, see Gambi L., Gruppo di Valorizzazione della Valle del Sillaro 2000, file 170. For a representation of the site in 1245, see Pini 2001, Fig. 2.

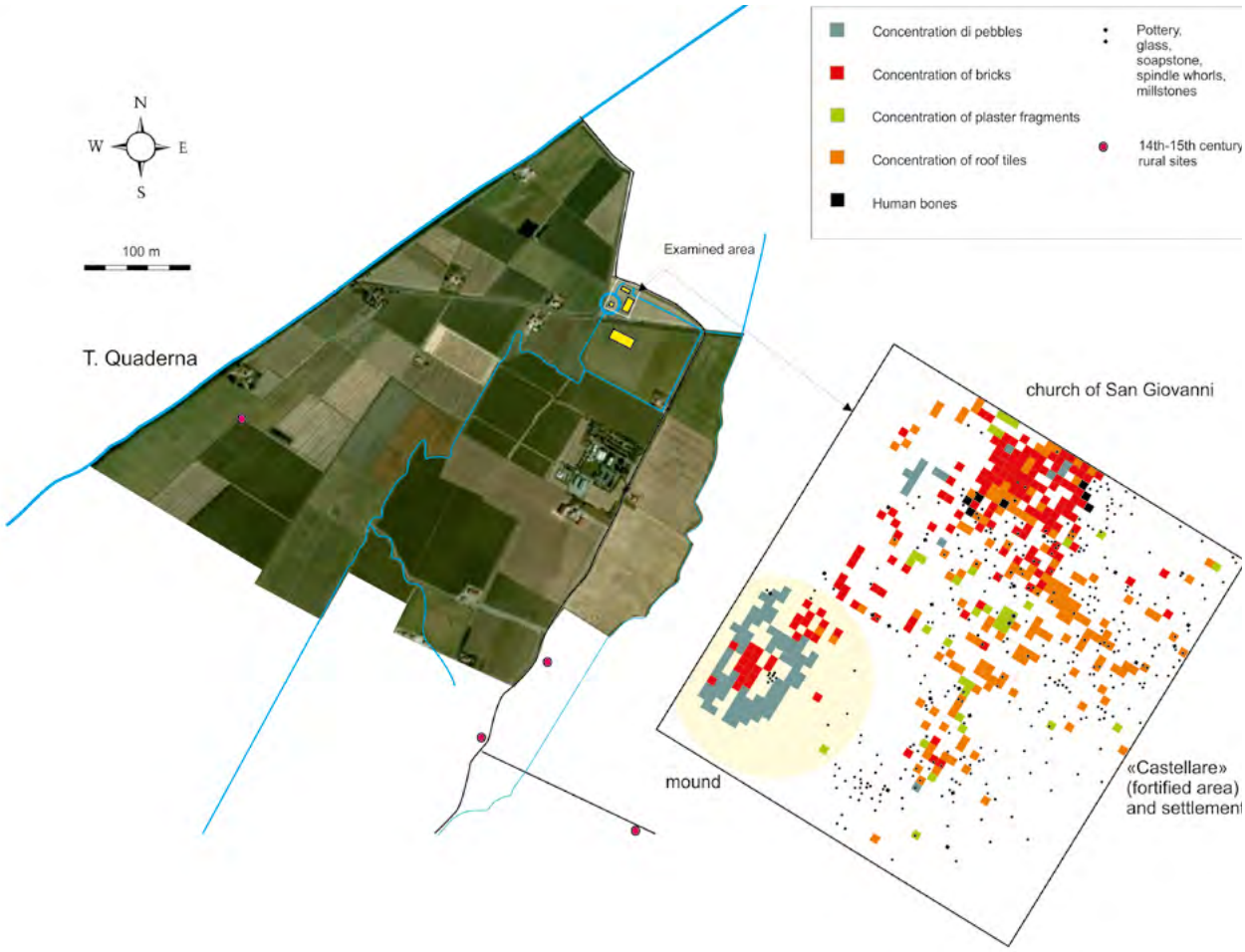

Figure 6. Archaeological survey, Galisano (Prunaro).

Far from these well-defined trajectories, however, we can observe the development of a series of settlements that did not have the characteristic features of the *castra* (castles), while being chronologically quite close to the latter (Librenti 2012). The best-documented case on the Bolognese territory is that of Galisano, a site that was mostly inhabited between the 13th century and the beginning of the 14th century. During that period, the community must have been articulated into a number of socially distinct groups. This situation, described in a detailed cadastre dating from the beginning of the 14th century, perfectly matches the data of the survey (Figure 6).

At the beginning of the 14th century, the site featured a few architecturally relevant structures (Librenti and Zanarini 1991: 56-63), but in 1371 the community recorded only 15 inhabitants over a total of little more than the double owning properties on the territory. From an archaeological standpoint, by the end of the 14th century the area appears to have been virtually deserted. The site consists of an ancient settlement located north of the current road, and of a substantial but more recent inhabited area divided into parcels in the south. Today, the two settlements are therefore located to the north and south of *strada provinciale 253 S. Vitale*, which at the time did not run there but along the trench that surrounded the site. The more ancient settlement, north of the road, had a church, a private *tumba* and a *castellarium*.[11] The archaeological surveys carried out to the north of via San Vitale clearly show the settlement's social complexity, which was well reflected in its configuration. From the presence of movable goods such as kitchen and table ware, manufacturing tools and luxury items, we can infer that Galisano was a permanent settlement with a socially stratified population. That very same social dimension represents an essential key to understanding the topography of the site, which included the entrenched *tumba* of *Martinus Sulimani*, with buildings and a masonry tower placed on an artificial *motta* (mound) still visible to this day (Librenti and Zanarini 1988, figure 8). The survey also shows that the neighbouring structures, i.e. the ones included in the *Castellarium* (almost entirely owned by the *heredes qd. D. Bonacursii de Galixano*, a Bolognese refudee) along with others in

[11] *Castellarium* commonly refers to deteriorated fortified settlements.

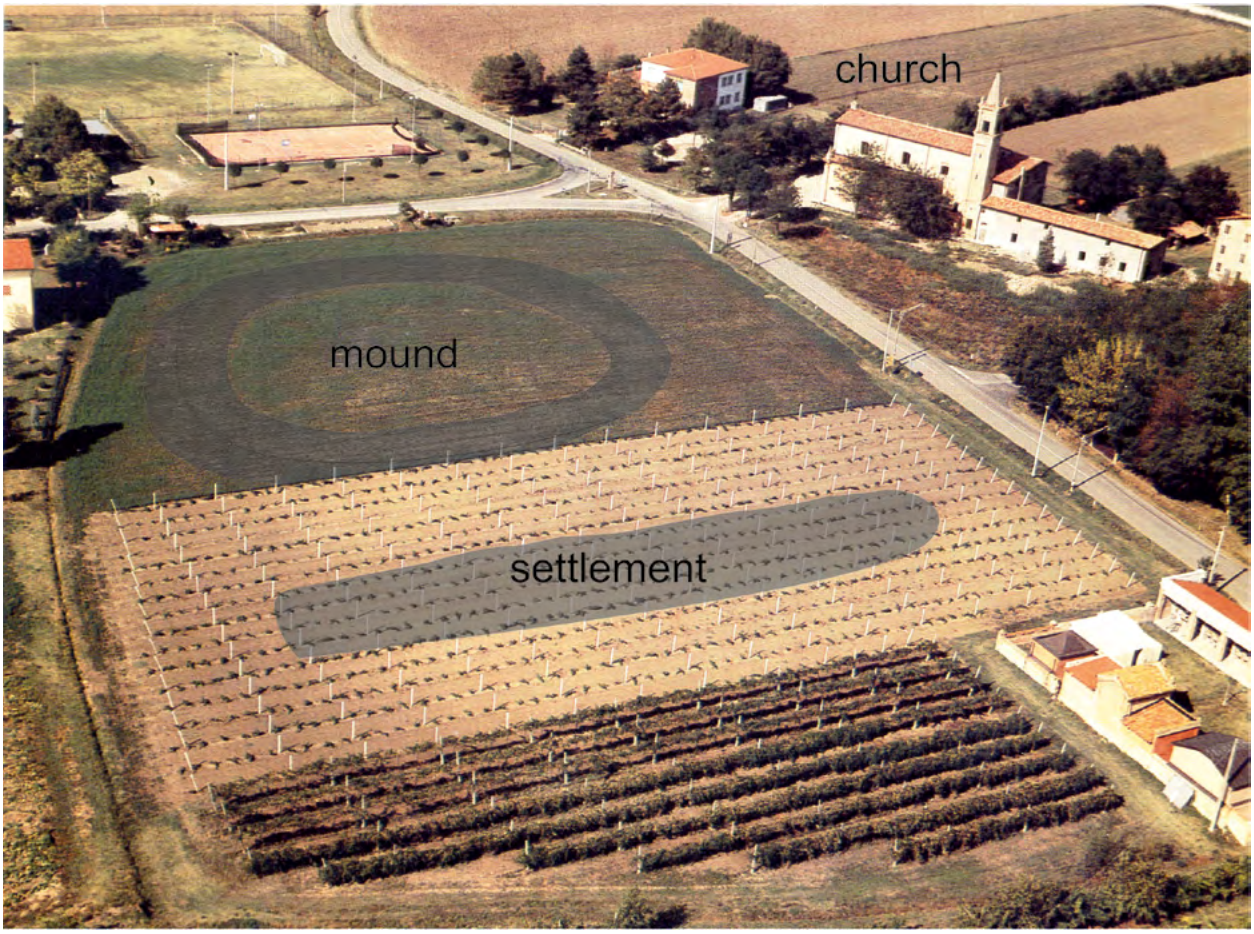

Figure 7. Settlement of Poggio Piccolo (from aerial photography).

the vicinity, must have been prevalently made of wood and earth, despite the presence of one house *magna et plana*. As for the settlement to the south of the road, it appears to be a kind of extension of the more ancient one. The materials found in the site suggest that it is more recent, from which we can infer that there must have been an attempt to expand the original settlement, an attempt that must have failed as a consequence of the 14th century crisis. At the end of the 14th century, the inhabited area hardly presented any trace of human presence in the northern sector, if not for a few fragments of pottery of 'graffita arcaica padana' type.[12]

We can wonder if Galisano constitutes a valid model of settlement. Still in the Bolognese area, we find a similar example nearby, in the settlement of Poggio Piccolo (Figure 7). If the site is virtually ignored by archival sources (Librenti, Michelini and Molinari 2004: 41), surveys indicate that it was quite developed between the 13th and 14th centuries and that such development subsided around the mid 14th century. Its subsequent decadence is testified by the fact that, in 1371, cardinal Anglic counted it together with Borgo Piccolo and recorded only a modest number of families, most of whom could be located in rural buildings (Dondarini 1990: 91). The site includes a rectangular building and a mound that is now flattened out and lacking of any dating elements. Aerial photos do show, however, that the trench had been refreshed or extended, suggesting that the site did continue to exist for quite some time.

Archaeological observations appear to identify a model which is also quite frequent in the Po Valley. The investigations carried out in the Veneto area, for instance, identified a considerable number of similar sites, characterised by a significant stratification of chronological layers corresponding to condensations of new forms of settlement. In particular, the situation in Castelminio di Resana (Treviso) is particularly pertinent to the Bolognese area. It features a settlement formed by a mound and two buildings, with clearly visible above-ground remains and trenches. Although the chronology of the interventions is no longer readable, the gradual concentration of the population, possibly from a first Early Medieval settlement, can be clearly seen (Grandi, Laudato and Masier 2013).

Moreover, in our territory, these settlements were often contiguous with religious buildings, which is

[12] On the evolution of the production of slipware and sgraffito ware in Emilia Romagna, see Gelichi 1986: 24-28.

never the case with Medieval *castra* but quite often so in neighbouring areas, as the case of Bagnarola Vecchia (Librenti 2012, table I). Such religious structures appeared to serve as important poles of aggregation, leading to the formation of similar settlements, either centralised or scattered along the road network.

Settlements and signs of social distinction

Only rarely does archaeological evidence on the presence of settlements provide any data about their social composition. As a matter of fact, most reconstructions are almost uniformly based on ceramic finds alone. Fortunately, numerous other elements escape this rule. A significant instance thereof is constituted by structural traces and in particular by private fortifications. The latter can consist of artificial rises with a building on top, or by simpler structures in which the building is surrounded by a trench (Settia 1980). Both types are often indiscriminately called either *motta* (mound) or *tumba.*

Scholarship has long used the term *motta* to identify the remains of various fortified settlements (Spinelli 1906), although some of those sites clearly are no more than sequences of frequentation layers and debris. Settia interprets the specific case of actual mound as the result of a military and aristocratic custom imported in Italy from abroad, and in particular from northern Europe. The archaeological data of the Bolognese area, however, clearly date these structures to the end of the Late Middle Ages. For instance, the mound of the castle of Crocetta dates within the 11th century (Gelichi and Librenti 2014: 409-412). Precocious signs of this phenomenon, which ought to be primarily read as the expression of a social élite,[13] must be dated with some caution. However, archival sources also indicate a certain precocity (Settia 1999: 325-353). Our data, in any case, are essentially in line with the analysis of De Bouard, who dates the beginning of this phenomenon to the 11th century (De Bouard 1975).

The private sites with heterogeneous defence structures that can be dated to the following centuries are much

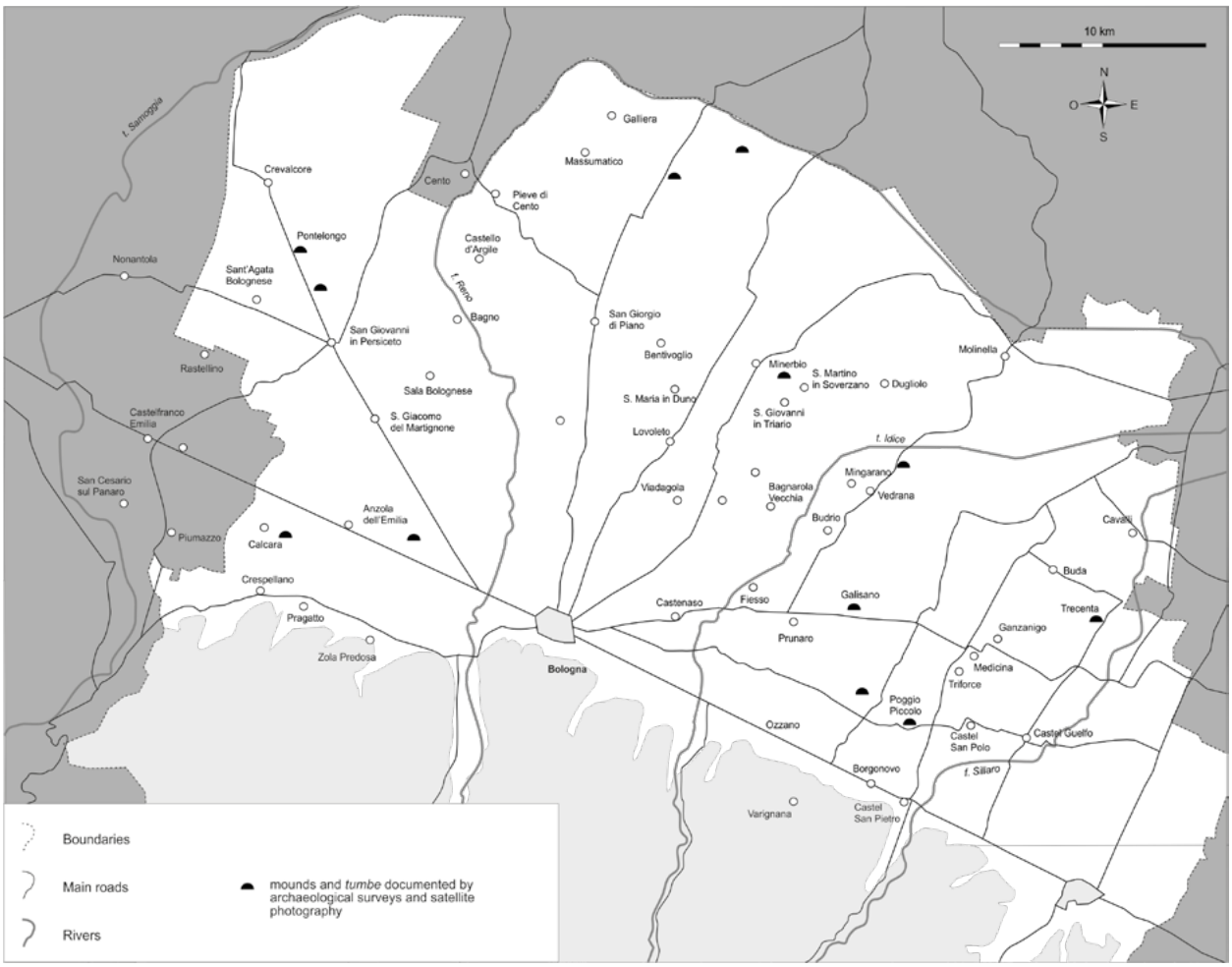

Figure 8. Mounds and *tumbe* between the 13th and the 15th century (from archaeological surveys and aerial photography).

[13] Ghislaine Noyé (Noyé 2013, p. 15) observes that in Normandy 'mounds and small fences served mostly as a means for local aristocracy to assert itself'.

Figure 9. Early 16th century building, Tombe di Cristo Re site, Anzola nell'Emilia.

more frequent. In particular, *tumbe* surrounded only by trenches and ramparts appeared to be largely widespread between the 13th and the 15th centuries (Settia 1980),[14] in connection with prevalently aristocratic strongholds. We should note that this situation is rather common in the hillside, albeit with clearly different features. In the area of Rimini, for instance, we find tumbe that mostly correspond to fortified buildings (Leoni 2009). Little more than ten *tumbe* have been archaeologically identified so far in the Bolognese territory, but their number might increase if we had more aerial photos, provided that the crops were in adequate conditions (Figure 8).

The significant increase of these structures from the 13th century onwards indicates a parallel increase of privileged people living in the area, although their control over the land did not always leave a clear trace. At the beginning of the 14th century, for instance, the *tumba* of *Martinus Sulimani* in Galisano was close to the *castellarium* owned by the Bonaccursi family. In this case, the relationship between the mound and the settlement appears to be almost parasitical, insofar as a member of the urban élite settled his building in a location already marked by a strong human presence.

The 15th century *tumbe* of the Bentivoglio family in Maccaretolo (Fanti 1996; Librenti 2007) represents a different case. These *tumbe* are the fruit of the family's policy of expansion, which started in the mid century also with the acquisition and establishment of palaces and fortified sites such as the so-called *castello* (castle) of Ponte Poledrano.[15] The site of Maccaretolo features the massive presence of masonry fortifications, which were probably unusual in similar contexts: a ravelin and a tower. However, the ensemble is protected by a simple trench dug around a large aristocratic house. No artificial rises can be observed, except for a backfill along the defence perimeter of the trench. The so-called *Tombe di Cristo Re* (Figure 9) near Anzola dell'Emilia also present themselves as a rural structure with a dovecote tower: the buildings are visible on the same level as the surrounding field. This typology, characterised by what we could call a simplified defence system, also includes the site of via San Giovanni in the municipality of Ozzano dell'Emilia (Figure 10) and that of via Palio, near Minerbio (Figure 11). On the basis of aerial photos, the sites appear as a simple rectangular trench whose internal area is mostly scattered with the ruins of a

[14] For instance, in the Bolognese area of Medesano, in the 13th century, buildings often consisted of *tumbe* (Zanarini 2010: 21). The archaeological recovery of a similar structure in the Po Valley is reported in Rodighiero and Carrara 2013, who describe a circular mound inside a square moat with gates of access.

[15] On the expansion of the Bentivoglio family on the territory, see Bocchi 1970, in particular Carta 3: 56.

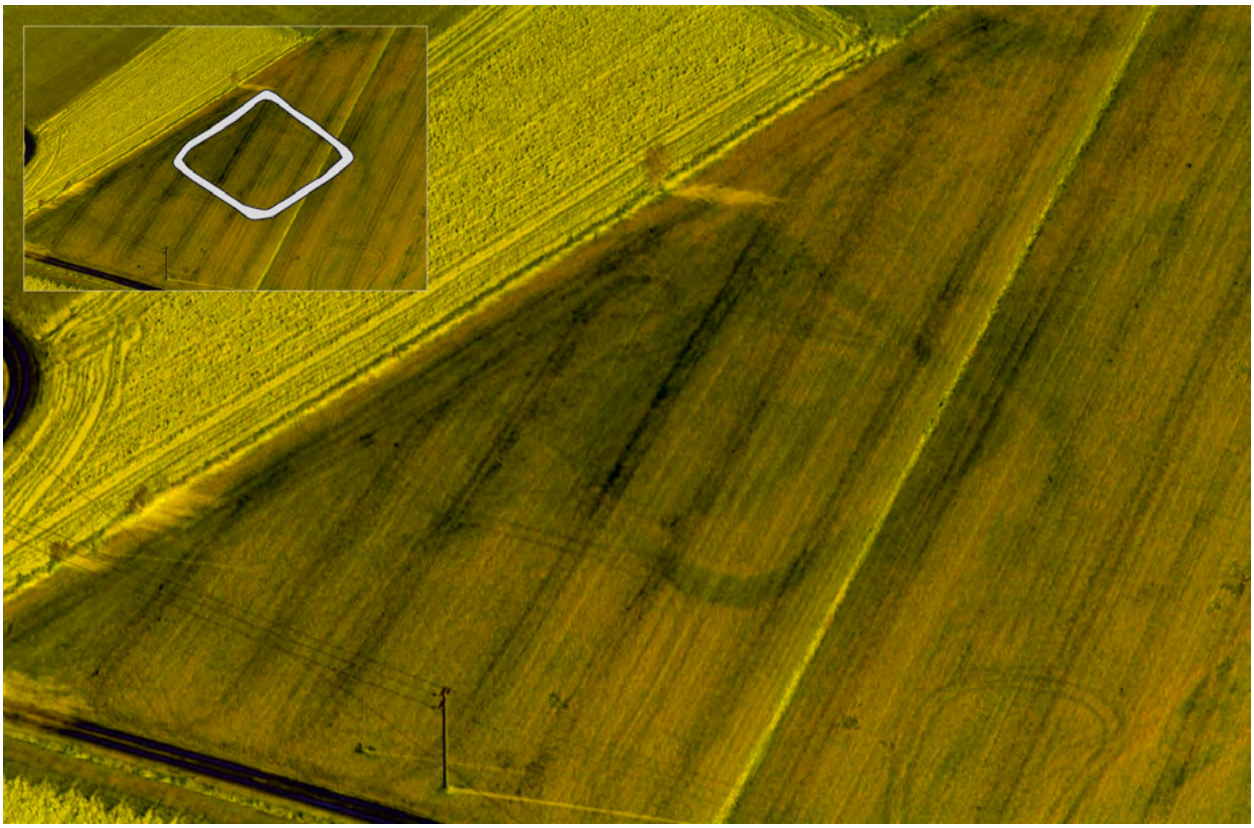

Figure 10. Evidences of a rectangular moat (*tumba*), aerial photography, San Giovanni road, Ozzano nell'Emilia.

Figure 11. Evidences of a rectangular moat (*tumba*), aerial photography, via Palio, Minerbio.

Figure 12. Re-elaboration of two plans from the original drawings / Figure 11a. Plan of a residential building with angular towers in Mezzolara, Budrio. Fig. 11b. Plan of an aristocratic residence in Farneto.

building, with materials dating from the late 14th and 15th centuries (Librenti 2007, Figure 3).

From the 13th century, the construction of artificial mounds seems to subside and leave the place to less sophisticated defence structures, although the underlying ideology did not change. The last version of this concept took the form of rural constructions surrounded by wide trenches but without any ramparts. Similar cases are quite frequent, as testified by historical cartography. However, it clearly appears that the function of these structures, along with the military appearance of some of their buildings, was little more than symbolic.

The 15th century sees elements of social ostentation multiplying across the territory. Historians have extensively documented the social peculiarity of the Italian case, characterised by the capillary ascent of a class of magnates who asserted themselves over the bourgeoisie as a recent but sufficiently powerful aristocratic élite (Goldthwaite 1995: 203-205). The substantial resources invested in the countryside fostered the dissemination of buildings of high social standing. In particular, from the 15th century onwards, the buildings of the élite appeared to associate the canonical features of rural constructions with the architectural signs of their social value. A detailed examination of these structures clearly shows that the aim was merely one of ostentation. The construction in Mezzolara (Budrio), property of the Ercolani family, is a case in point: its corner towers are clearly associated with a residential structure, as one can see from the layout (Figure 12a). Let us quote from the description of the construction, which mentions a *'casamento in foggia di Palazzo, con quattro torri nelli angoli di esso, ed un'altra torre nel mezzo del detto Palazzo nella quale torre vi è una colombara'*.[16] The functionality of the spaces, in which the kitchen and its *camino* (fireplace) are separated from the rooms and their *caminetti* (little fireplaces), clearly marks the difference with other buildings that had a similar structure but were used by farmers (Figure 18). An even more blatant, if not ironic, case is that of a construction in Farneto, on the Bolognese hillside, owned by the Bolognini family. The presence of trenches, although part of a context that was no lacking in signs of ostentation (such as the corner towers and

[16] Bologna State Archive, Periti Agrimensori, vol. 104, c. 79 v, a. 1620, in Gambi L., Gruppo di Valorizzazione della Valle del Sillaro 2000, file 46.

Figure 13. Development of decorative patterns (heraldic, vegetal and closure) on tableware between the first half of the 15th and the half of the 16th century.

the church) and despite an internal arrangement that was typical of the élite, had no other function than keeping the walls dry[17] (Figure 12b).

In any case, one should also not underestimate a less massive form of ostentation, namely the heraldic representations frescoed on the façades of the buildings or engraved on ceramics. In the latter medium, family crests quite a rare occurrence in the 14th and 15th centuries (Gelichi 1992b, figures 64-66), became rather common in the following centuries. Between the 15th and the 17th century, dishware featuring family crests (even improvised ones) became quite widespread, and their production was often entrusted to undistinguished workshops (Gelichi and Minguzzi 1986). An equally significant, if less remarkable feature is the appearance of the motif of the fence. Poetically interpreted by numerous ceramics experts as representations of the *hortus conclusus*, these fences probably reflected the attention of the new élite for matters of property and control (Librenti 2007: 56). From the first half of the 15th century, we can indeed observe the inclusion of an iconography related to the theme of fences and therefore of enclosures (Johnson 1996: 74-75; Rapetti 2006: 53), which created a significant connection with heraldry and botany. This graphic evolution achieved its final synthesis in the mid 16th century, with objects that represented only family crests (often imaginary ones) and a simplified latticework (Figure 13).

Scattered settlements

Historical readings of settlements based on archival sources neglected the topographical specificities of the rural sites scattered across our area. The view was that the phenomenon could be chronologically generalised and that it was in symbiosis, as it were, with the agricultural exploitation of the land (Galetti 2011). However, archaeological data indicate that the individual areas composing the system do not all present homologous characters. The systematic investigation of the territory of Nonantola (Modena) hardly yielded any clues in that sense, although the site is often mentioned in the contracts of the time. This lack of information continued almost until the Late Middle Ages, and can be ascribed the monastery's will to discourage this kind of behaviour (Cianciosi and Librenti 2011: 98, figure 12). And yet, a few km to the west but still in the province of Modena, researchers identified a rather substantial network of settlements

[17] Bologna State Archive, Periti Agrimensori, vol. 104, cc. 128v-129, a. 1625 in Gambi L., Gruppo di Valorizzazione della Valle del Sillaro 2000, file 45.

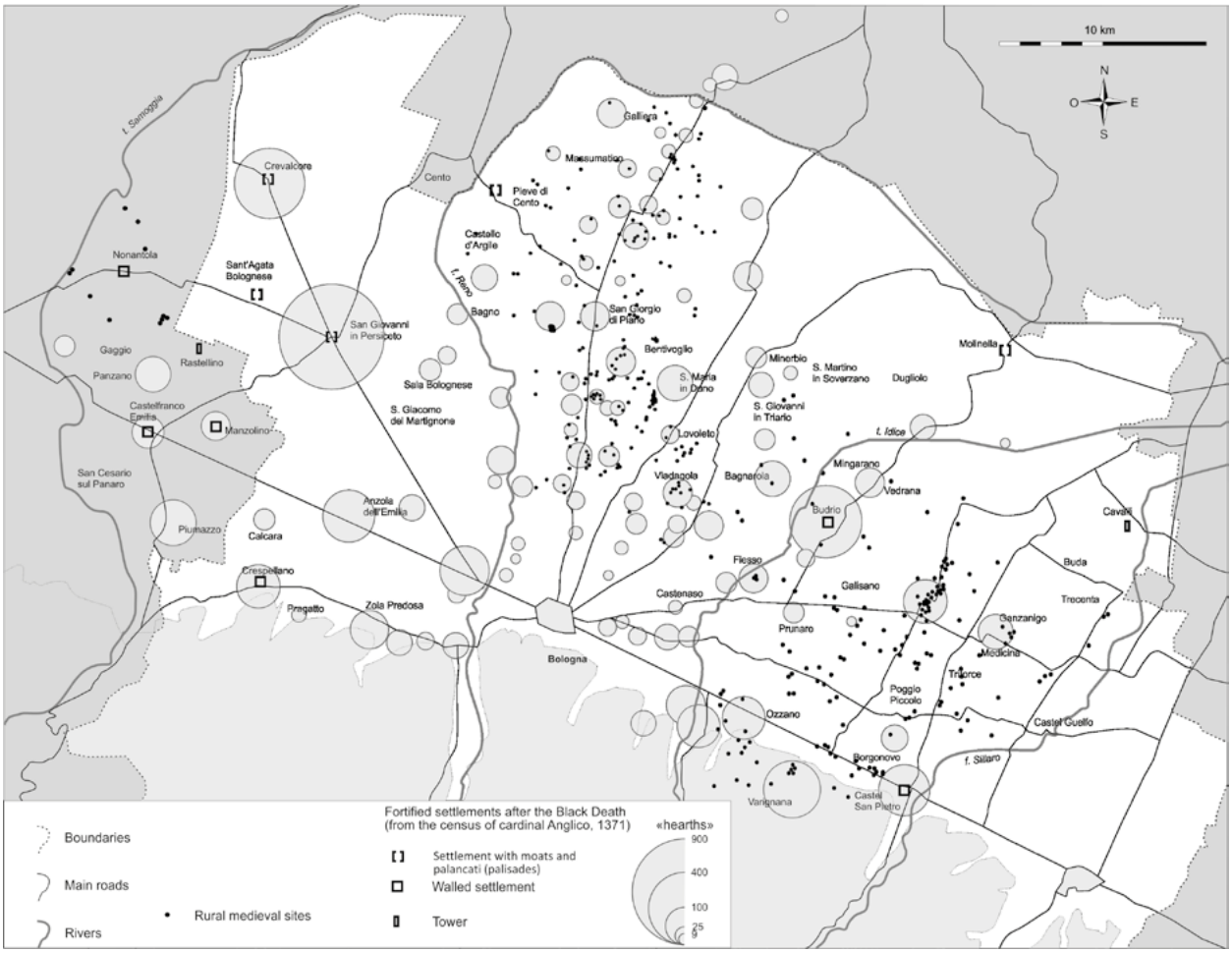

Figure 14. Population and fortifications in the census of cardinal Anglic (data from Dondarini 1990, tav. C, p. 99) compared with information from archaeological surveys.

dating to the 14th century (Casinieri 2008). [18] In other sites in the same area, studied by the province's archaeological cartographers, the population density was considerably inferior. The Formigine area, which was repeatedly surveyed (Cianciosi 2005: 163), registers a modest increase in the sites from the 14th century.We must therefore conclude that Late Medieval settlements were the result of multiple and inhomogeneous choices and hence, that their neighbouring areas could be radically different.

Archaeological surveys of the Bolognese area found the remains of several tens of rural buildings from the Late Middle Ages. The data available on the rebirth of a generalised and scattered form of settlement can be clearly dated back to the full 13th century. At the time, most of the fortified sites founded in the Early Middle Ages were abandoned, while others were being founded or consolidated by the Commune's authorities (Figure 14).

From a topographical standpoint, we can observe that rural buildings stood generally close to minor road networks, which suggests a close connection between these buildings and the birth of roadways (Librenti and Zanarini 1991: 103-106). In other words, until the 14th century, rural houses directly overlooked the road.

A few, quite extended conglomerations of buildings were also observed. A well-documented example is located along the axis of via Fasanina (Villa Fontana, Medicina) and the neighbouring territory, particularly close to the religious buildings recorded in the area since the 12th century. The *villa*, a non-fortified settlement (Settia 1999: 31-33), was part of the community of Medicina until the beginning of the 14th century, and is attested at least since the 12th century as belonging to the Bishop of Bologna, in whose ownership it remained until 1393 (Librenti and Zanarini 1991: 92). At the time, the rural settlement consisted mostly of buildings made of non-durable material and was inhabited by a lower-class population. The latter had been possibly attracted

[18] The investigation was targeted at 15% of the buildings – now disappeared – that were originally featured in the late 16th century in Boccabadati's highly accurate cartography. The cross-section, in particular, indicated that 80% of the samples survived in the following centuries.

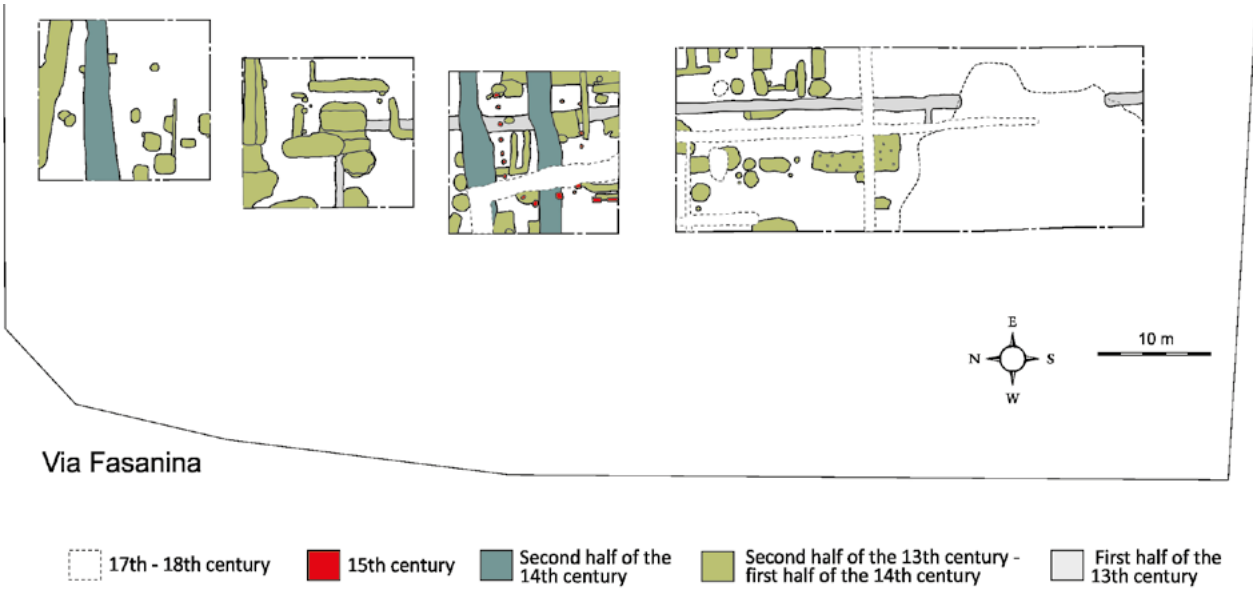

Figure 15. Archaeological excavation in Fasanina road, Villa Fontana, year 2000 (Soprintendenza Archeologica dell'Emilia Romagna).

by the nearby castle of Medicina, which had been fortified by the Commune of Bologna in 1385.

Two excavations carried out near the road in 2000 retrieved the remains of a dense stratification marked by trenches and *spolia* of structural remains. The analysis of the settlements suggests a significant succession of interventions (Figure 15).

The first phase is marked by the presence of a single trench, which probably ran around a 13th-century structure. This structure left a large amount of materials in the area.

A second stage, which presumably lasted one century, saw the production of a remarkable number of occasionally intersecting incisions and holes, whose gradual organization cannot be precisely reconstructed, due to the area's reduced size and scarcity of index fossils. Some of these trenches could be the remains of regular wooden structures, either residential or functional, that were removed or damaged after being abandoned. The poles aligned in the vicinity of small ditches could be the traces of torn-off structural elements. However, as the floor layers were destroyed by successive ploughings, these elements cannot be adequately interpreted. On the northern side, the settlement appears to be delimited by a trench. The materials collected seem to indicate that the settlement was inhabited between the 13th century and the first half of the 14th century.

In the next stage, several trenches were dug across the area following an east-west orientation. These trenches seem to coincide with the abandonment of the settlement and with its conversion into agricultural land.

Finally, a further stage must have seen the construction of a functional building standing on posts (maybe a shack). The building stood next to a rural house in masonry which can be approximately dated to the 15th century, and whose demolition left the greatest amount of traces present on the site. The surveys carried out in 1996 recorded a considerable concentration of bricks just next to the road, associated with a substantial presence of materials from the Late Middle Ages and Modern era. To sum up, the excavated area appears to have been settled by a community between the 13th and early 14th, then abandoned and ruralised until a construction was built there in the 15th century.

The observed sequence could take on a much wider paradigmatic value, insofar as it appears to reflect the general tendency of settlements in the eastern part of the Bolognese area. A wider reading of the territory of this Commune shows that the disappearance of these communities represents a landmark in the population dynamics of the area. Significantly, according to survey-based estimates of the settlements of Villa Fontana in the first half of the 14th century, the inhabited centres covered almost half of the surface in use (Figure 16) (Librenti and Zanarini 1991, figure 24). Moreover, even though a significant number of isolated buildings were abandoned in the same period, there is a much higher percentage of cases of continuity.

Thus, in archaeological terms, the late 14th century coincided with the beginning of a general scattering of the settlements, despite the cases of abandonment. It is

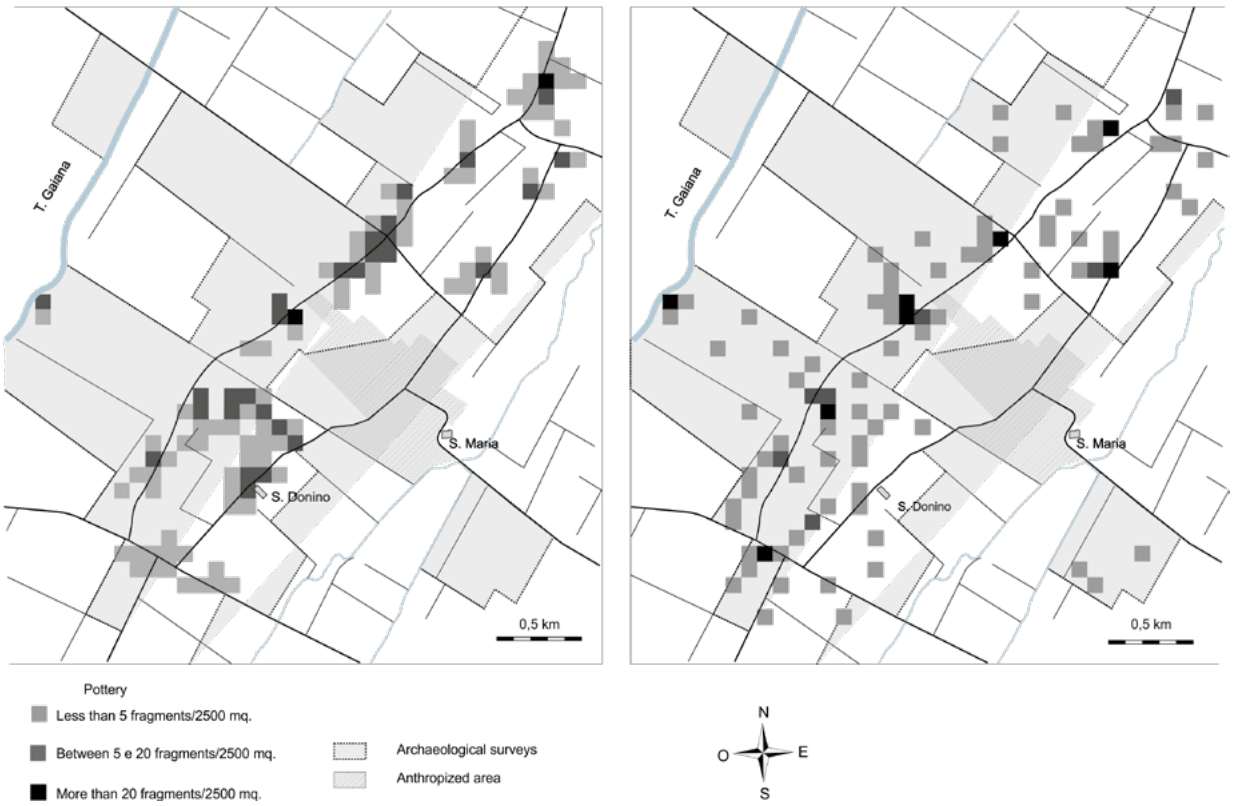

Figure 16. Trasformation of settlement between the 14th (left) and the 15th century (right), Villa Fontana.

worth noting that a significant part of the population remained in previously settled areas. This might indicate a process of gradual incorporation into farm collectives. This hypothesis is confirmed by the scarcity of structures built *ex novo* in previously unoccupied areas in the course of the 15th century (Librenti and Zanarini 1991, figure 26-27).

The analysis can be justified by the new socio-economic circumstances that emerged in the second half of the 14th century. The economic crisis, which culminated in the plague epidemics of the middle of the century, had significant repercussions on Bologna and its territory (Dondarini 2007). Although the phenomenon is difficult to measure, the urban population was estimated to have decreased by about one third (Pini 1993: 18). The decrease in the workforce and the increased labour costs led to new forms of contracts in the countryside and to the incentivisation of sharecropping, to the detriment of traditional contractual forms (Dani 2011: 83-84; Montanari 1984: 86-108). In a first stage, the emergence of these new contracts in the region concerned only the territory of Reggio Emilia, then eventually reached Bologna in 1370 (Piccinni 1993: 249-250). During the first decades of the 15th century, the Bolognese area registered an increase in the size of the properties, which is indicative of their incorporation into *poderi* (farms) (Ascheri 2011: 12-17; Cortonesi 2011: 114-116), as well as an increase in sharecropping contracts (Monti 2007: 1060-1062). The dissemination of farms radically transformed the land management system in terms of both structures and agricultural practices. This process, which touched an important part of central and northern Italy, had already started in the 13th century. In the Late Middle Ages, these new contracts, based also on the exploitation of pre-existing settlements, became quite widespread as a result of

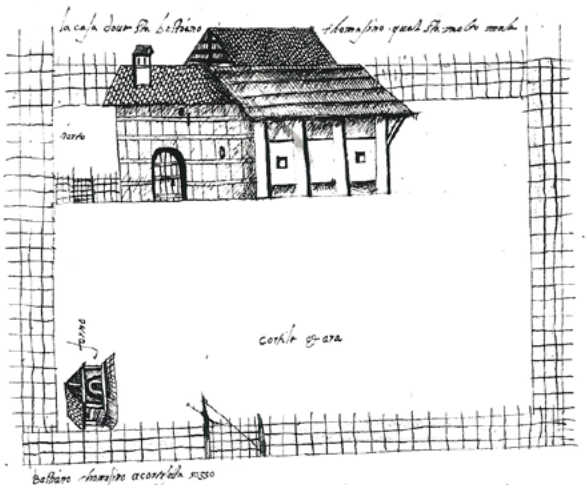

Figure 17. Timber building, property of *BastianoThomasino in Comune di Corticella*, from a drawing of the 16th century (ASBo, Demaniale, SS. Naborre e Felice, 69/6758, c. 53, a. 1567).

Figure 18. Plans of 17th century brick buildings, re-elabored version based on original drawings (ASBo, Periti Agrimensori, S. Domenico, vol. 107, c. 53, a. 1650).

the urban élites' investments in the countryside.[19] The economic mechanisms that emerged in those years would later lead to a substantial impoverishment of the farmers, who saw their margins of profit decrease while their business risks increased. Nevertheless, the socio-economic framework that emerged from this choice was destined to mark the Bolognese territory until the last century.

An important development was the fact that landowners took part in the establishment of rural buildings, although the number of new constructions did not increase significantly until the Modern Age (Dani 2011: 81-83). This new development is not documented in the archaeological investigations of our territory. However, we do have a considerable amount of information about the situation in the centuries that followed the end of the Middle Ages. Thanks to archival sources, the Bolognese area lends itself to a rather precise reconstruction of the transformations undergone by rural structures between the 16th and 17th centuries. The maps preserved at the Bologna State Archive,[20] which hosts the archives of private figures and of monasteries, testify to the gradual standardization of the constructions. The square, two-storey buildings were regularly arranged around a central loggia from which one could access the various working and domestic spaces. This model became widely spread in the 16th century.

A comparison between two Bolognese *cabrei* – the one of the monastery of Santi Naborre e Felice, dated 1564,[21] and the one of San Domenico,[22] which is one century older – reveals a gradual rationalisation of rural constructions. The images testify to a gradual standardization of the buildings: initially heterogeneous and still largely supported by wooden structures with earthen internal walls (Figure 17), they evolved into constructions made entirely of masonry. In the properties of the monastery of San Domenico, this phenomenon can be clearly seen in the arrangement of the buildings, despite the numerous extensions and modifications due to the greater number of rooms used by the families (Figure 18).

We do not know if the 16th-century model of Bolognese rural constructions was the spontaneous expression of a pre-existing functional model from the 15th century, or rather of a rational urban plan. The only archaeological data available, namely those from

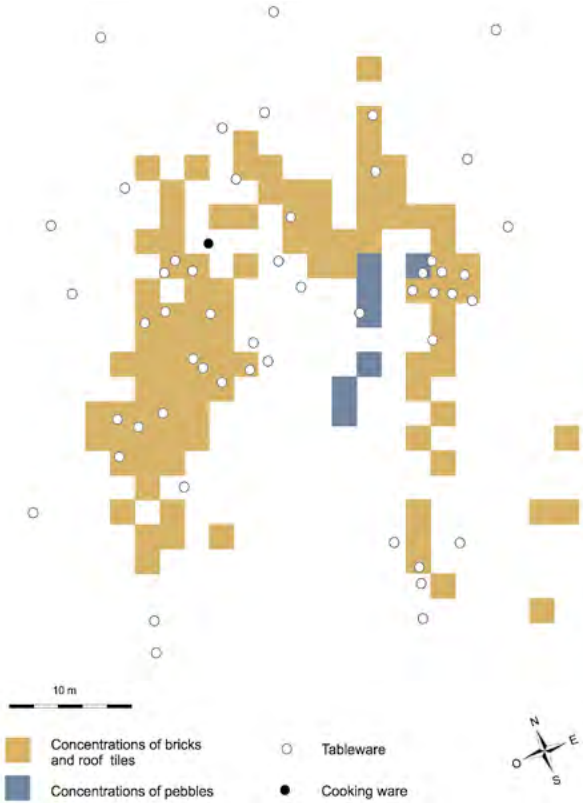

Figure 19. Evidence of a rectangular brick building from an archaeological survey in Cantagrillo street, Medicina.

surface surveys, indicate that early 15th century rural buildings presented a variety of solutions, some of which were more structured compared to those of the previous century. In some sites one can observe traces of cobble and masonry foundations, while other coeval sites were still entirely made of perishable materials. The comparison clearly highlights a difference in technological development, although the ceramic remains are quite similar. The grid of the areas and the interpretation of the density of the materials present on the surface show, in the first case (Figure 19), what appears to be a rectangular building with a base made of bricks, cobble foundations and a tile roof. In the second case, the elongated building appears to be made entirely of perishable material, except perhaps for a fireplace made of bricks (Figure 20). In one last, extreme case, pottery is associated to inhomogeneous cores of rarefied construction material that might indicate the presence of extremely small and entirely perishable buildings (Figure 21). Numerous *medali* (functional buildings in wood and marsh reeds), are often recorded in historical sources until the 18th century (Librenti and Zanarini 1991: 93). The lack of data on the internal arrangement, however, prevents us from making conjectures on the function of the spaces. We can suppose that these structures matched the owner's social standing (Galetti 2011: 93-98), although

[19] Cortonesi describes the emergence of these contracts as resulting from the differentiation of the resources of the *consorterie* of Tuscan magnate families since the early 13th century (Cortonesi 2011: 114). In Bologna, for, instance, the Pepoli family owned since the 14th century a significant amount of properties, thanks to the credits they acquired with the rural communities (Giansante 2002: 5-6).

[20] We are referring in particular to the 'Fondo Periti Agrimensori' of the Bologna State Archive (Bambi 2000).

[21] Bologna State Archive, Demaniale, 69/6758.

[22] Bologna State Archive, Periti Agrimensori, vol. 107.

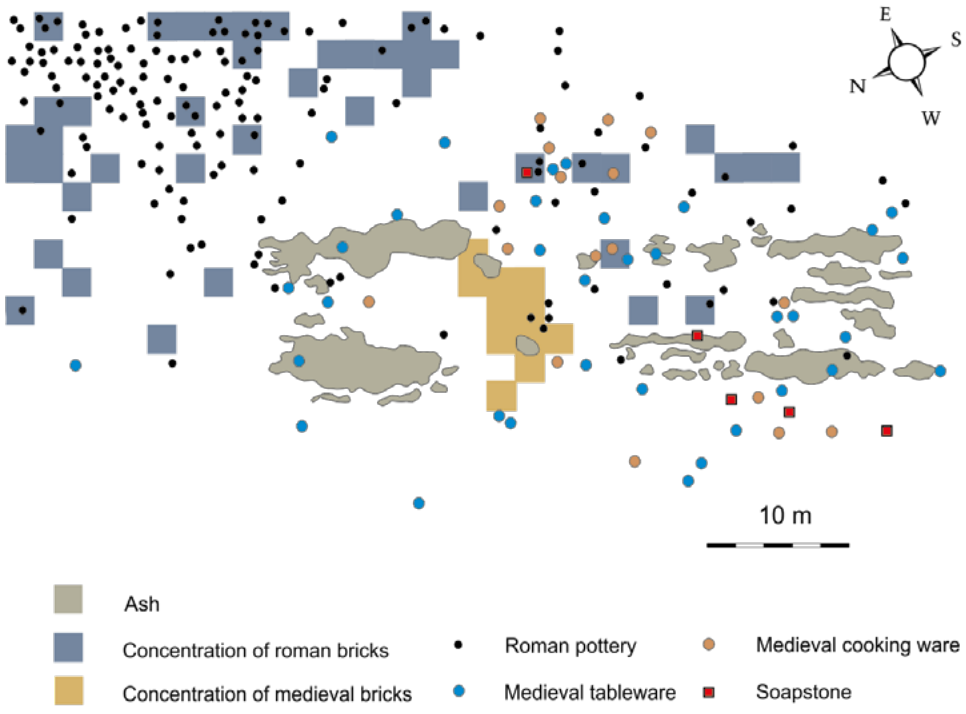

Figure 20. Evidence of a rectangular wooden structure with traces of *hearths* from an archaeological survey in San Donato street, San Martino Soverzano.

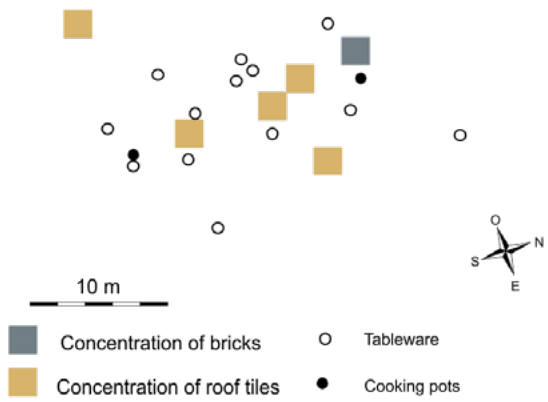

Figure 21. Association of pottery and few constructing materials from an archaeological survey in Vigo street, Medicina.

we should not forget that numerous buildings belonged to non-residents.

The remains of human presence

The great amount of ceramic finds lends itself to being analysed from a variety of perspectives. First, generally speaking, one can observe the homogeneity that characterises rural and urban finds. We are indeed unable to clearly discriminate between the two contexts from a qualitative standpoint. Workshops sold massive amounts of products all over the Bolognese territory through local markets. These workshops were initially located in the main urban centres, such as Bologna and probably Imola. Only from the 15th century onwards do we find products crafted in minor centres such as Castel San Pietro (Librenti 2001: 97-100) and San Giovanni in Persiceto (Gelichi 1986).

The limited typological variety of rural sites should not prevent us, however, from analysing a few characteristics of rural consumption. Until the end of the 13th century, the situation is rather hazy, as the only items in circulation are coarse ware such as domestic oven (the so called *catini-coperchio*), ovoid cooking containers with a raised handle, as well as a very limited number of cooking jugs.[23] During the first decades of the 13th century, the ceramic vessels for table use found in the Bolognese territory are limited to very few items, consisting of Venetian jugs and bowls. These items were retrieved in San Polo e a Castel San Pietro, both of which were *liberi burgi.*[24]

Thus, the introduction of majolica ware after the second half of the 13th century radically transformed a context in which table ware was virtually absent, and naturally led to a diversification. We are thinking, first, of the table containers belonging to the early stage of 'maiolica

[23] The circulation and usage of these objects in the territory in the 13th century are illustrated by the discovery of Piazza Moro in Castelfranco Emilia, where theyare featured in a military context that is closed and particularly homogeneous: Librenti and Zanarini 1998: 88-89, Figure 17.

[24] In both cases, the materials ame from *borghifranchi*. The finds in San Polo include the fragment of a glazed bowl, *spirale-cerchio* type (Gelichi 1988: 28, Figure 5, number 3) and the original fragment of the handle of a jug, *S. Croce* type, group 2 (Gelichi 1993: 278-279). From the excavations carried out in the square of Castel San Pietro Terme comes a small slipware body fragment from a 13th century context (Librenti 2001: 95).

arcaica' type, such as jugs with the characteristic foot with a flared profile, and jugs *a sacchetto* (Gelichi and Nepoti 1990: 133, figure 14). We must assume, however, that the rather substantial use of wooden materials did not end with the introduction of majolica ceramics, as testified by the artefacts found in coeval contexts (Gelichi 1992a; Guarnieri 1999: 138-142).

The first half of the 14th century sees the dissemination in the countryside of ovoid or with a characteristic keel-shaped profile jugs, hemispherical and trilobed bowls and basins. Of course, the number of items varied with the density of the population: isolated buildings generally feature very few items, while populated areas have more. This phase also saw the diffusion of specific functional objects such as glazed oil jugs of various sizes (Gelichi 1992b: 68-71, figure 125), salt cellar (Gelichi 1992b: 68-71, figure 59) and, more rarely, *albarelli* (Gelichi 1992b: 105-107) and glazed lamps (Gelichi 1987: 188-191).

In the course of the 14th century, as was the case in urban areas, the fortified sites discovered new forms of cookware, in particular pots, as the case of Castel San Pietro (Librenti 2001: 85-88), including glazed ones. Pots decreased and were gradually replaced by ovoid cooking containers and handles of various forms and sizes. The phenomenon is less evident in the countryside, where domestic oven were still used for baking. Rural contexts, besides, registered a significant use of soapstone cooking containers in the form of wide cylindrical boiling pots. Such items, still found in the late 14th century, were clearly used for home cooking. Another significant data is the presence of millstones both in Late Medieval castles in scattered buildings that were considerably more recent (Gelichi and Librenti 2009: 352-354). Such millstones indicate that numerous aspects of food production had a markedly autonomous character. This is also suggested by the presence of considerably large domestic ovens (*catini-coperchio*) for baking bread, items that had virtually disappeared from urban centres. Glass objects such as mold-blown bottles and glasses shaped like truncated cones appear to become quite common in the mid 14th century (Stiaffini 1990: 110-111). Depurated ware, a typical artefact of the eastern part of the Bolognese territory, represents an unusual find in Bologna, whereas these items were quite common in the Romagna region since the 14th century (Gelichi 1992b: 57-67). A significant number of jugs and storage ware were found in castles and rural sites. However, they tended to disappear in the following century.

The late 14th century witnessed a significant evolution, involving also the countryside: the usage of ceramics was extended with the introduction of slipware and sgraffito ware such as jugs, basins and bowls, while items that had specific functions such as oil jugs and salt shakers seem to disappear or, at least, to radically decrease. Well into the 15th century, one can observe a marked increase in tableware, including various kinds of glazed and sgraffito polychrome ware. Other items that became quite common in the same period include glazed storage ware, such as large *ollae* with handles, round openings and glazed in green on the inner surface.

Between the first half and the end of the 14th century, the usage of ceramics was therefore markedly different. The main trend appeared to be one of simplification, with the disappearance of several forms of tableware and the emergence of new items whose function was to preserve food (Figure 22). In our opinion, this trend may be due to the gradual transformations of a social fabric which, until the middle of the 14th century, appears to have taken a significant part in the circulation of urban products. The variety of tableware indicates a rather sophisticated lifestyle and a sufficiently high social status. We can assume that some of the buildings belonged to people who lived in nearby castles or in farms of high social status, and whose eating habits must have been sufficiently refined.

From the late 14th century, the contexts became increasingly associated with farm dwellers and with an economic system based on sharecropping contracts. From a strictly typological standpoint, this passage was characterised by a change in the variety of artefacts. The increase in the number of objects for individual use (bowls, plates and basins) does not compensate, however, for the disappearance of some specific forms such as oil jugs, *albarelli* and salt cellar. The same trend determines the dissemination of generic vessels, presumably used for preserving food. Finally, in the 15th century, we still find in the background a range of cookware that did not differ much from its 13th-century counterpart.

If this trend should not be seen as the result of clear-cut transformations, it is nevertheless indicative of gradual evolution of consumption around the mid 14th century. The situation was also inevitably linked to an increasingly agile distribution system, no longer limited to the relationship between an urban centre and a small number of fortified sites or, to a lesser extent, the rural dwellings of the élite. From the 15th century, the craftsmen that were scattered across the territory started reaching markets of minor social standing with an increasing variety of relatively unsophisticated products.

Conclusions

The title of the present work is a slightly tongue-in-cheek reference to archaeology's predominant and long-lasting focus on the centuries that preceded

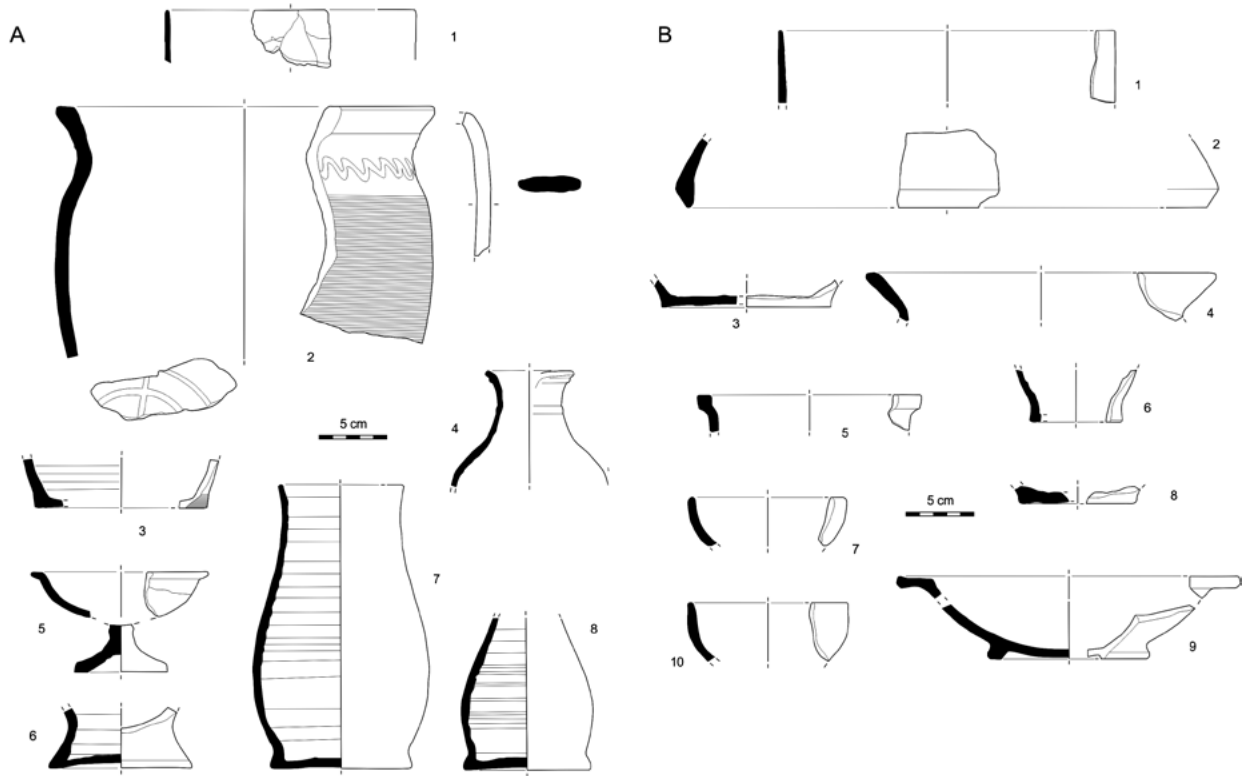

Figure 22. Comparison between pottery assemblages of the 14th century (A: from Ganzanigo, Medicina) and of the 15th century (from San Tommaso, Medicina). A. 1 soapstone; 2-4 cooking containers; 3 purified pottery; 4 glazed pottery; 5-8 tableware of *maiolica arcaica* type. B. 1 soapstone; 2-4 cooking containers; 5 glazed pottery; 6-8 tableware of *maiolica arcaica* type; 9-10 tableware of *graffita arcaica padana* type.

and followed the end of the Roman Empire, to the detriment of Late Medieval and modern history. We cannot underestimate the extent and impact of the transformations that marked the passage from what remained of the Roman Empire to the new political and social reality of the 6th and 7th centuries (Brogiolo and Chavarria Arnau 2005). Let us note, however, that history has known other transformations that were just as radical, although their archaeological expression is often reduced to a confused heap of disparate data. As is well known, one of the defining features of these centuries of transition was the passage from a predominantly urban territorial system of scattered rural settlements to the much more articulated system that emerged from the evolution of political and social mechanisms. The archaeological investigation of the centuries that go from the crisis of territorial *signories* to the Modern Age, however, allows us to identify a series of changes that are no less pervasive in both quantitative and qualitative terms.We do not know to what extent the conclusions of our case study can be applied to other territories: most of the dynamics observed can be ascribed, on the one hand, to the Commune's choice to invest its resources, including military ones, on a series of sites that were destined to gain considerable advantages from these policies; and on the other, to the rural investments made by the urban élites. A particularly relevant factor is the impact of the crisis of the mid 14th century on social re-aggregation phenomena. The latter were markedly private took place after the crisis of the *castra* of the *signories*. Anglic's demographic-fiscal inventory describes *a posteriori* a territory that divided into rather disparate areas. To the west, the population appeared to be gathered in the few surviving fortified sites, while the central and eastern regions witnessed a significant development of rural constructions, whose communities seemed to lack major directional centres. We can note that archaeological surveys indicate that the zones of maximal expansion of a scattered population in the Late Middle Ages objectively coincided with those territories that remained for a long time under episcopal control, such as the eastern and Saltopiano areas. The decreased importance of territorial *signories* in those areas appears to have encouraged the development of scattered forms of settlement, culminating in the formation of open villages in the vicinity of churches.

In the western part, on the one hand, the main poles of demographic concentration were therefore represented by strong directional centres. Those centres were supported and protected by the Commune of Bologna by means of repeated investments. On the other hand, the socially complex communities that had been forming (as in Villa Fontana) or expanding (as in Galisano) in the east appear to systematically

perish. Around the mid 14th century, their ambitions seem irreparably crushed. The same happened to the *liber burgus* of San Polo, closed in as it was between the fortified properties of the Pepoli family in the Medesano and the fortified castle of San Pietro on the via Emilia.

In any case, the crisis that led to and followed the plague appears to have merely exacerbated the consequences of the city's policies and of the massive public and private investments in the countryside. Indeed, the implantation of farms on older rural settlements from the previous centuries is not a rare archaeological occurrence. This phenomenon suggests that the continuity of the process was merely slowed down by a crisis that touched various forms of territorial management born after the end of Early Medieval *castra*, but perhaps only the less efficient ones. The cases of depopulation inaugurated a new era that was archaeologically marked not only by a multiplication of rural constructions, but also by a gradual simplification of the contexts of usage inside the building, probably in conjunction with the emergence of sharecropping. The establishment of the farm system between the 15th and 16th centuries promoted not only the economy, but also the ideology of the new aristocratic and monastic élite scattered across the main centres of the territory. The impact on the Bolognese area was huge. Indeed, farming led to a radical transformation of the landscape, with a population density and social uniformity that it probably had not witnessed for centuries.

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‘Emptyscapes’ and medieval landscapes: is a new wave of research changing content and understanding of the rural archaeological record?

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Abstract

The Emptyscapes project is an interdisciplinary program designed to stimulate changes in the way in which archaeologists in Italy in particular but also more generally in the Mediterranean world study the archaeology of landscape, moving from an essentially site-based approach to a truly landscape-scale perspective. The aim is to help in the development and wider application of new paradigms for landscape analysis based on the integration between ‘traditional’ approaches, multidisciplinary studies and new methodologies in the form of large-scale geophysical prospection, high-resolution LiDARsurvey and environmental studies (geo- and bio-archaeology). At present, the geographical focus lies for the most part in central Italy (Tuscany and Lazio) but it is planned to extend the scope to include other European Mediterranean countries such as Spain, Greece and France.

Keywords: empty spaces, empty phases, scales of detail, archaeological continuum, holistic, Mediterranean

‘To see what is in front of one’s nose needs a constant struggle’

George Orwell

Introduction and backdrop to the project

Research in the Mediterranean area reflects a real gap between archaeological recording and broader aspects of interpretation. This is not just historically conditioned but also results from the natural characteristics of the Mediterranean landscape. Architecture and urbanism in the ancient cities lend themselves very well to investigation (Sommella 1988). By virtue of their monumental importance, artistic value and easy accessibility the ruined remains of ancient structures have always been a focus of research (Carandini 2012). This is also true for preserved remains of Greek field systems and Roman centuriation, which have been recorded from the ground and from the air from as early as half a century ago (Settis 1993). By contrast, sites and landscape features outside the ancient urban centres, most of them now completely buried and therefore invisible to the naked eye, have less frequently been investigated. From about the end of World War 2 a new interest in landscape studies appeared in the Mediterranean area (Bintliff 1977; Potter 1979). Since the mid 1970s there has been an explosion of archaeological research in the majority of circum-Mediterranean countries (Alcock and Sherry 2004). The main approach in this revived research activity has been field-walking survey, within a variety of project-based strategies (Haselgrove *et al.* 1985; Bintliff and Snodgrass 1988; Francovich *et al.* 2000). This pioneering post-World War 2 and later field survey work has produced dramatic data that has made significant contributions to the reconstruction of the past. Virtually every region that has been explored has produced results which demanded the revision or review of pre-existing ideas (Broodbank 2013).

However, going into the detail after millions of hectares of Mediterranean landscapes have now been surveyed by this kind of terrestrial reconnaissance it is legitimate to ask: which questions have been answered? In essence the general contribution is quite clear to summarize. There are two main fields where a substantial impact has been achieved: settlement and trade patterns, both at the Mediterranean and at the regional scale; and contributions to specific chronological phases, above all the Roman period and the classical age in general. By contrast, these survey projects have generally produced poor results for the pre-classicaland medieval periods, though the degree of impact has varied from area to area and from one methodology to another (Bintliff 2000; Campana 2009; Hodder and Malone 1984; Runnels 2003).

Moreover, the reconstruction of settlement patterns represents only one element in landscape complexity; this framework, for instance, generally reveals little about environmental transformations and human interaction (pedology, land-use and the like). As a consequence a wide variety of questions within the sphere of archaeology, history, anthropology and

the environment are under-represented within this approach. Furthermore, the reliability and the impact of distorting factors affecting field-walking survey have been debated for decades without much being achieved in resolving inherent methodological weaknesses, in comparing the results of different surveys and in establishing relationships between the survey results and demographic trends (Alcock and Sherry 2004).

There are further biases that affect the results of landscape study based on the current methodological framework. Two decades ago Barker, in his introduction to the Biferno valley (1995), outlined how Braudel (1949) in his opening chapter (part one of *La Mediterranée*) lamented how lowland environments had tended to dominate most previous analyses of Mediterranean history. Landscape archaeology has failed to confront or resolve this bias since the application of field-walking (as well as other methods such as aerial survey and geophysical prospection) is strongly influenced by present-day land-use in ways that have mostly restricted their impact to ploughed land and therefore for the most part to lowland contexts. Higher land is mainly wooded or put down to pasture, which are less responsive to field-walking survey; however, positive results on grassland may come from aerial archaeology and geophysics (Musson *et al.* 2005). It is worth commenting in this context that about 50% of the European Mediterranean landmass falls into this category (FAO 2006). Despite these obvious weaknesses historians as well as archaeologists have continued to use the results of field-walking survey to support interpretative models, speculative settlement patterns and large-scale landscape transformations. At the same time the answers to major historical questions are still for the most part being sought through textual analysis and archaeological excavation rather than through landscape studies (Witcher 2006).

However, from the late 1990s the methodological debate in the Mediterranean area has become less intense. Meanwhile, in the UK from almost a hundred years ago (Barber 2011; Bradford 1957; Crawford and Keiller 1924) and more recently in some other parts of Continental Europe such as Austria (Neubauer *et al.* 2013), Belgium (Bourgeois and Meganck 2005) and Germany (Braash and Thiel 2005; Hesse and Bofinger 2011), archaeological prospection has been based on a balanced integration between aerial photography and field survey, allied in recent years to airborne laser scanning (LiDAR). This kind of approach, which influenced the development of true 'landscape' studies, was facilitated in Britain and elsewhere mainly by the favorable physical context in terms of land-use and pedology (Barker 1986). Another significant issue should be recognized in the character of the local material culture, particularly the widespread presence of so-called 'negative features' in the form of readily-buried post-holes, ditches and pits in contrast to 'positive' features such as walls and floors of hard materials that leave long-lasting traces on the ground surface or in debris brought to the surface by ploughing (Campana 2009).

For similar reasons innovative non-destructive methods, particularly geophysical prospection but also the collection of LiDAR and multispectral data, have been strongly developed within UK and European archaeology (Bewley and Raczkowski 2000; Opitz and Cowley 2013). Some UK case studies have shown extremely clearly the high potential of a holistic approach in the use of multiple survey and investigation techniques, radically challenging previous assumptions about settlement patterns at a variety of periods in the past (Powlesland 2009). It should be noted that the recent and still-tentative introduction of this kind of approach in the Mediterranean area has generally been associated with international research programs (Burgers *et al.* 2012; Johnson and Millett 2013; Keay 2013).

In the last two decades a central role in the continuing debate about methodology within archaeology and landscape studies has been provided by three major long-term European research projects: the POPULUS project (1995-2000; an overview in Barker *et al.* 1999), the Radio-PAST project (2008-2013; Corsi *et al.* 2013) and the Archeo Landscapes Europe project (2010-2015; Kamermans *et al.* 2014), all strongly associated with universities and other institutions belonging to both the continental geographic sphere and also the Mediterranean area.

However, notwithstanding the effort, the commitment and the outstanding results of these EU-funded projects there have been few case studies where new frameworks have been implemented (Brogiolo *et al.* 2012; Campana 2009; Ceraudo and Ferrari 2009; Volpe 2015). Likewise, it is unusual to see the integration and implementation of geo-archaeological survey (Vaccaro *et al.* 2013; Vermeulen 2005) or interest in and strategies for the collection of ecofacts (Di Pasquale 2011). Therefore, despite a few worthy exceptions, we are still confronted by the fact that field-walking survey and the collection of surface material in rural areas still represents the prime prospection method, followed by and in some cases integrated with vertical aerial photography (Cambi 2011).

Research hypothesis, questions and objectives

The central purpose of this paper is not to offer a preliminary report on the Emptyscapes project but rather to focus on the methodological issue of 'visibility' within the archaeological record; indeed, without keeping constant attention on this issue as well as on other distorting factors, the interpretation

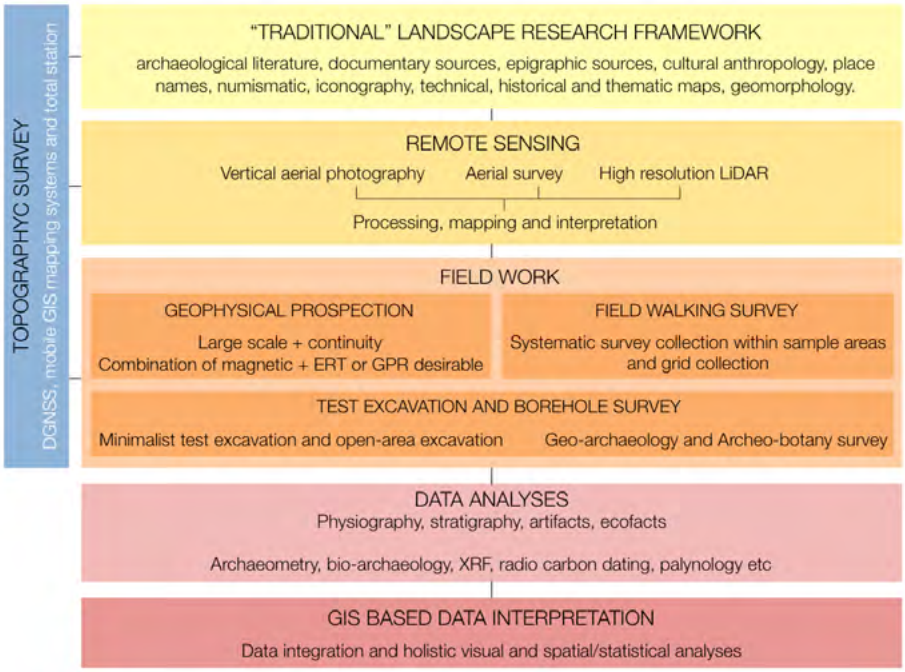


Figure 1. Diagram of Emptyscapes project research framework.

of past landscapes through a continuing concentration on field-walking survey will remain at best precarious but for the most part unsatisfactory and unreliable. The present paper derives from the first year of a two year project – Emptyscapes – funded by the European Union under the Marie Curie scheme. However, it should be emphasised that archaeological questions, methodological issues and research activities at the core of the project are deeply rooted in the work carried out by the writer and his research team over the past two decades at the University of Siena and in the impact of wide-ranging international and academic partnerships (Figure 1; Campana 2009; Campana and Forte 2001; Campana and Francovich 2003).

Moreover, for Italy, this project forms one of the first attempts to apply a holistic approach encompassing many different methodologies to reconstruct the linked evolution of cultural and environmental landscapes within a Braudelian 'longue durée' approach spanning from prehistory to the medieval period. This research project could perhaps be seen as an 'outrider' for what could be achieved in the Italian countryside by drawing upon approaches most extensively used up to now in the UK and in some parts of continental Europe, thereby encouraging more sophisticated approaches to landscape archaeology in the Mediterranean area.

The resultant picture should be less about 'sites' than about apopulated landscape in the social, economic and environmental context, including field systems, communication and trade networks, industrial and agricultural foci in addition to domestic settlements – all of these necessary to underpin the 'monumental' sites that have so far dominated the archaeological record. The project is aimed to find a new balance – assuming there was ever a real balance in the past – between site and off-site archaeology, bridging the two categories or expanding the concept of 'site' to what might be called a 'catchment area', a block of landscape perhaps varying in size from one area and time-period to another. Moreover, the extent and location of the landscape under investigation, and of any such blocks within it, will obviously be influenced by theoretical approaches, practical considerations and specific archaeological questions (on these see Powlesland 2009).

That said, within this context the Emptyscapes research strategy falls into four interlinked categories (Figure 1):

1. So called 'traditional' approaches, essentially based on the examination of archaeological literature, documentary sources, epigraphic sources, place-name evidence, iconography, technical, historical and thematic maps, geomorphology, field-walking survey, and aerial photography.
2. Environmental studies based on geo-archaeology and bio-archaeology analyses.
3. New techniques in the form of high-precision, high-speed, large-scale geophysical survey and the collection and analysis of high-resolution LiDAR data.
4. Minimalist test-excavations.

Geographically, the project focuses on two sample areas in Central Italy: the rural landscape around the hilltop Etruscan, Roman and early Medieval town of Roselle *(Rusellae)* in southern Tuscany near Grosseto; and the

now-rural but formerly-urban historical landscape of the Etruscan and Roman town of *Veii* in Central Lazio, near Rome (Figure 2).

Within this background the general objectives of the project can be summarized as follows:

1. To place the experience so far gained in Tuscany and Lazio in a broader Mediterranean and European context through the review and analysis of information about relevant case studies elsewhere. Particular attention will be paid to issues concerning the apparent 'invisibility' of important elements within archaeological landscape and the potential impact of strategies based on the use of 'traditional' methods in an integrated partnership with geophysics, remote sensing, geo-archaeology and bio-archaeology to allow archaeologists to detect previously 'invisible' parts of the ancient landscape. This will involve investigating both contrasts and similarities between urban and rural environments in the application of these approaches.
2. To confront and hopefully fill the gap between palaeo-environmental history and anthropic evidence by integrating environmental studies within the methodological framework of Italian landscape archaeology.
3. To focus on archaeological analysis and GIS-based interpretation in a multi-scale landscape context. This is a key element because of the danger that data-collection might become increasingly divorced from historical debate unless a healthy dialogue can be promoted between those at the cutting edge of methodological development and those using the collected evidence to address archaeological questions (Johnson and Millett 2013). Moreover, we need to keep in mind that apparent patterns in the archaeological data are often scale-dependent.
4. To improve understanding through the application of new technologies with particular regard to:
   - Evaluating the influence of these technologies in detecting changing archaeological patterns across time, from pre- and proto-history through the classical period and on into the Middle Ages and early modern period.
   - Improving understanding of the likely returns from differing methodologies applied in a variety of contexts, with the aim of formulating better and more holistic research strategies.
   - Improving planning and conservation strategies and policies in Italy. This could have a potentially tremendous impact on the quality of heritage conservation but also on business and employment in the Mediterranean area.
5. The current situation in Italy and most of the Mediterranean area needs to be radically changed by developing and applying new and holistic research strategies, which can explore the whole landscape as a *continuum* (on this point see Bintliff 2000). Just as from the 1970s onwards open-area excavation and associated changes in the nature and integration of archaeological documentation have transformed our understanding of both urban and rural domestic activity, so multi-faceted exploration of contiguous blocks of the central Italian landscape, combining

Figure 2. Representation of the research areas, with yellow circles for other relevant sites.

established and innovative archeological and environmental research, will fundamentally change understanding of the studied landscapes. Intensive and holistic work of this kind will make it possible to address new and more sophisticated questions about Mediterranean landscapes than are accessible within the present methodology, relying as it does on fragmentary and potentially distorted datasets.

Among other results, achieving a realistic view of the archaeological *continuum* can be expected to push archaeological research away from a reactive and towards a proactive approach, introducing a new analytical level that might best be defined as 'mid-scale analysis' – representing a bridge between the more traditional 'micro scale' of archaeological excavation the 'macro scale' of regional survey (defined in geography as small-scale, generally thought of as 1:50,000 or higher), both of which suffer from the risk of missing relevant evidence and relationships. Micro-, mid- and macro-scale studies are obliviously complementary, and all three are necessary for a comprehensive interpretation of landscape and settlement developments over time (Campana 2009).

Case study: *Rusellae* landscape

The sample area in this case study lies in Central Italy, in *Maremma*, a wide costal region in southern Tuscany and northern Lazio bordering the Tyrrhenian Sea. *Rusellae* was an important Etruscan and subsequently Roman town, which survived until the Middle Ages before finally being abandoned on 12th century. However, generic evidence of anthropic activity appears in the landscape around *Rusellae* from the upper Palaeolithic onwards. From the Chalcolithic there are the first signs of settlement in the area of the future city, probably attracted by the local mineral resources and the favourable position close to the docking and fishing opportunities of the *Prile* lake (Figure 3).

By the end of the Chalcolithic a hillfort was already in existence at Poggio di Moscona. The Bronze Age saw population growth and an increase in trade and socio-economic distinction, and from the start of the Iron Age there is increasingly clear evidence of villages; these were eventually abandoned, probably because of the expansion of *Vetulonium* on the opposite side of the *Prile* lake, a few kilometres west of *Rusellae* and a little later in its foundation (Figure 3).

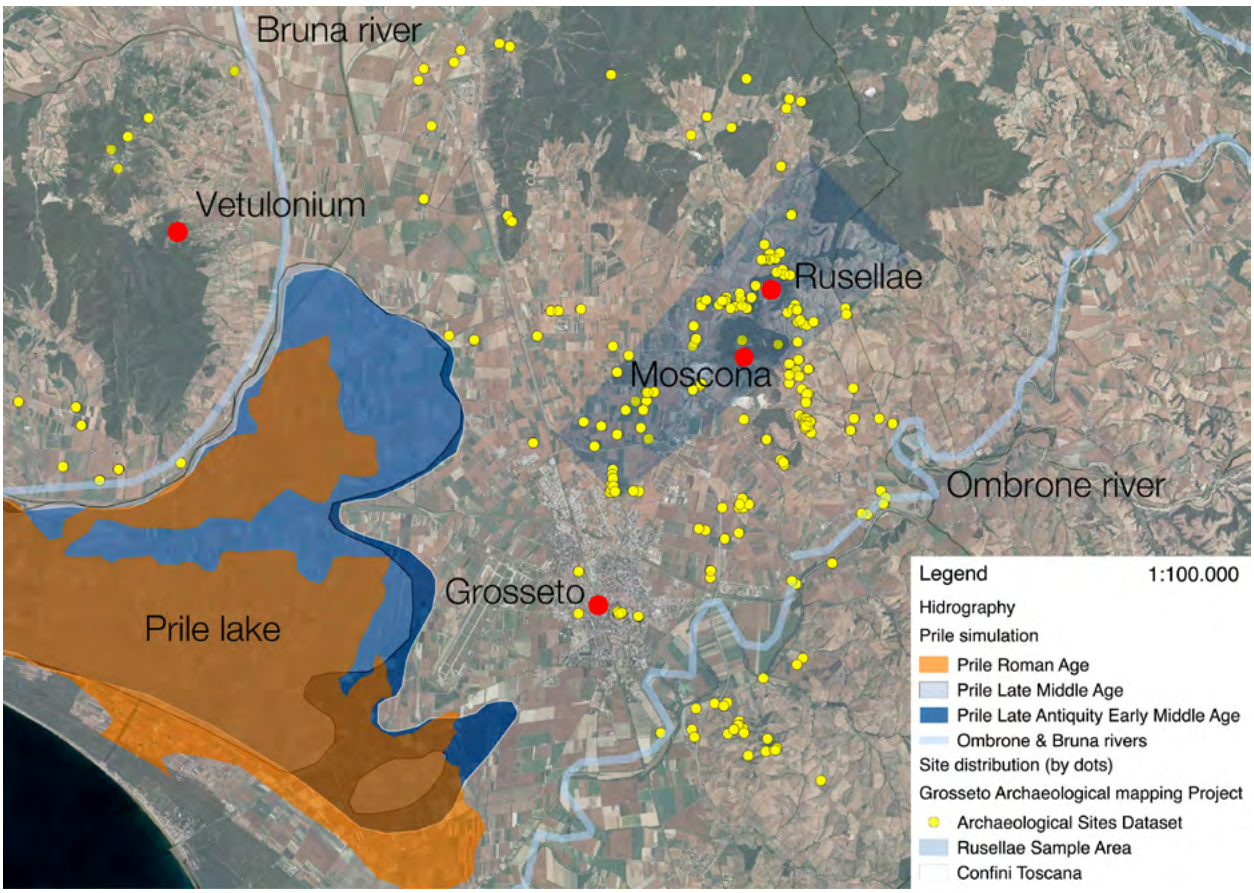


Figure 3. Archaeological distribution map of the Rusellae area, showing the results of three decades of archaeological survey work and mapping. The gradually reducing extent of Lake Prile, which gradually shrank in size from the 1st millennium BC up to the end of the Middle Ages, is shown in solid colour.

In the later phase of the Villanovian period the two hills of *Rusellae* seem to have been occupied by different groups, probably separated from one another by an area of pasture and open areas. Starting from the Orientalizing Period in around the mid 7th century there appear to have been city walls, a transformation in the topographic layout of the city and a generalise phase of public and private building activity. The process was continued and reinforced during the Archaic period, with a general growth of the city and the progressive development in the surrounding landscape of a network of dispersed settlements which were probably related to agricultural production (from the outset the main vocation of the area, along with trade). There also grew up a network of roads and other communication systems, no doubt also exploiting the waterway of the Ombroneriverto gain ready access to inland Etruria.

In 294 BC the Etruscan city of *Rosellae* was conquered by the Romans and from the end of 3rd to the middle of the 1st century BC there ensued a long process of further building activity within the city. Roughly at the same period, *Vetulonium*, after an initial recovery from capture by the Romans shrank to a secondary centre under the Empire, never to really recover. In the *Rusellae* area, as in the rest of Etruria, later centuries saw a major restructuring of the landscape, introducing Roman villa settlement and productive systems aimed at improving agricultural productivity. In the 1st century BC *Rusellae* was designated as a Roman Colony and from the 1st century AD there began a major phase of building activity, both within the city and in the surrounding landscape: forum, amphitheatre, temple, *domus*, further Roman villas in the countryside and maybe a pattern of centuriation (Nicosia and Poggesi 1998).

During the 4th century AD there is clear evidence of a further transformation including the conversion of public buildings into workshops and the abandonment and subsequent redevelopment of the public baths as a church. In the countryside, the pattern developed during the late Republican and the early Imperial phases fell into crisis during the Antoninian Age in the middle and later part of the 3rd century AD. From the 4th up to the mid 6th century AD a slight recovery is visible in the revival of a number of Roman villas, both close to *Rusellae* and in the more distant hinterland: at Aiali, Sterpeto and Casette di Mota for instance (Campana 2009; Citter 2007; Vaccaro 2012). It is also interesting to note that the vicinity of the future medieval city of Grosseto shows an increase in archaeological evidence from the 5th century AD onwards while the 'connective tissue' of fields and communication routes within the countryside was progressively transformed from the Roman structure to take on new patterns and scenarios (Sebastiani and Celuzza 2015).

However, *Rusellae* maintained its role as an administrative centre with a complex urban topography. Documentary evidence shows that from at least 499 AD the bishopric had its seat at *Rusellae*, remaining there until a move to Grosseto in 1138 AD (Celuzza 2011). The shift of the area's main urban centre and bishopric to Grosseto does not appear to have been a unitary and linear process and it would be extremely interesting to analyse whether any evidence of the process has been left in the landscape between these two central places: changes in the settlement and/or agricultural patterns, transformation and road systems, for instance. Nonetheless, the process will play a central role within the early Middle Age, involving first the Lombard and later the Carolingian lordships, the Papacy and a number of prominent aristocratic families, in particular the Aldobrandeschi. Evidence of urban activity in *Rusellae* are attested up to the 10-11th centuries, mainly in improvements to the fortifications. In the meantime in Grosseto, though still within a 'secondary' role, recent archaeological excavations have demonstrated a progressive development of the settlement area from the 9th to the 11th century, providing conditions for the transfer of the bishopric during the first part of the 12th century (Citter 2007). During this same general period, in this area as in the rest of Tuscany, there took place the process of 'incastellamento', the widespread development of hilltop villages. However, as Vaccaro recently emphasised:

> '*it should be stressed that in this area the population patterns of the 8th-early 10th centuries are extremely complex, diverse and rich in variants, to a much greater extent than hitherto thought*' (Vaccaro 2012).

Field survey, aerial photography and the detection of archaeological evidence

From the late 1970s onwards the University of Siena has fostered a systematic programme of landscape and archaeological investigation within the *Maremma* area.[25] As a result of this work the area now has a substantial database and GIS, developed mainly through the examination and analysis of the relevant archaeological and ancient literature, documentary and epigraphic sources, place-name evidence and systematic field-walking survey, along with a significant number of open-area excavations.

[25] The first research project was established by Prof A. Carandini under the title 'Ager Cosanus-Valle dell'Albegna' (Carandini and Cambi 2002). The same period saw the start of work by the late Prof R. Francovich, surveying Grosseto, Scarlino and the area of the Colline Metallifere (Francovich 1985). In more recent decades archaeological mapping and field survey has been continued, particularly by the author (Campana *et al.* 2005; Campana and Piro 2009) as well as by Bianchi (Bianchi *et al.* 2014), Citter (Citter and Arnoldus 2007) and Vaccaro (Vaccaro 2011).

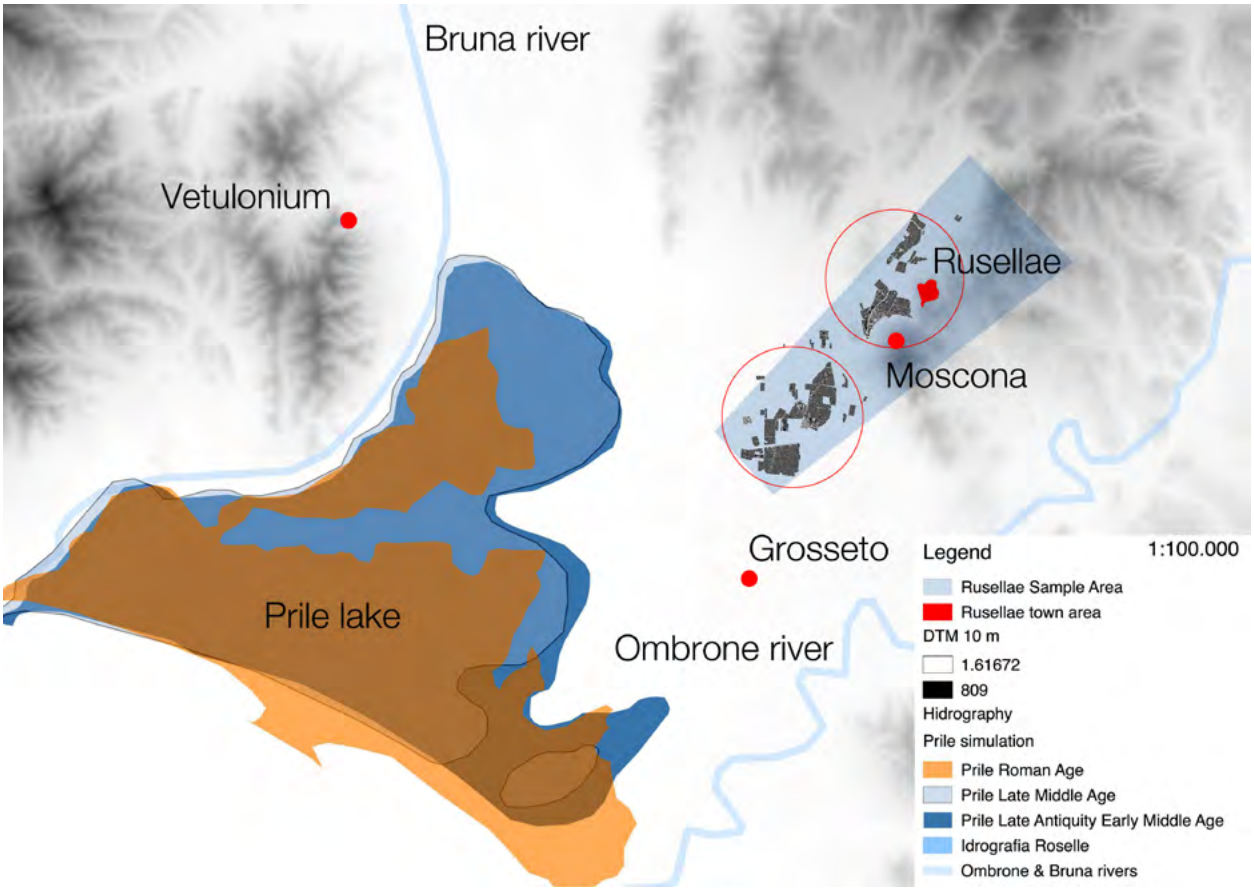


Figure 4. Map of the Rusellae study area summarising (in dark grey) the present extent of large-scale contiguous geophysical survey (mainly magnetic but also some smaller areas of electrical resistance tomography, ERT) within the trapezoid sample transect. For more detailed information see Figures 6-9. In the background map lowland is shown in white and upland in mid-grey.

After about 35 years of rigorous research work it could be argued that this region is among the most intensively studied areas within the Mediterranean. However, despite the large amount of information assembled and examined over the years, we have to acknowledge that many important archaeological questions still remain unresolved. These may perhaps be categorised under two main keywords: 'empty spaces' and 'empty phases'. For instance it quickly becomes obvious that the archaeological record assembled so far shows some very clear gaps both in space and time. It has been pointed out elsewhere (Campana 2009) that in this area, as in the rest of Tuscany and in other intensively studied parts of Italy such as Puglia and Lazio, around 90% or sometimes up to 95% of the evidence so far recovered relates to the time span from the 6th century BC to the 6th century AD. Prehistory, the Iron Age and the Middle Ages are therefore poorly represented within our present record. Moreover, if we look again at the1:100,000 distribution map in Figure 3 and switch our attention from 'sites' represented as dots to the overall 'background' it is easy to appreciate how the 'empty spaces' predominate.

This realisation raises a crucial question: what are we missing? The answer is before our very eyes: *the landscape and its transformations across time*. In an attempt to answer the conundrum of the 'empty phases' and to 'fill' what at present appear to be 'empty spaces', the Emptyscape project has been making an intensive study of a sample transect of the landscape between Grosseto and *Rusellae*, the size and location of which promises to fit these objectives. The area now under study is the mid-blue trapezoidal area in Figures 3 and 4, placed so as to provide a diachronic perspective and to answer some major questions related to the three major cities of *Rusellae*, Grosseto and *Vetulonium*: for instance the urbanisation of the Etruscan cities and in particular their relationship with the surrounding countryside, the Romanization of the cities and the landscape, the process of Christianisation and finally the impact on settlement, society and economy of the end of the Antiquity and the beginning of a new era, that of the Middle Ages. It should be clear, even from the short introduction that this area has the potential to illustrate the human and massive landscape transformations that characterise the many centuries of the 1st and early 2nd millennia AD.

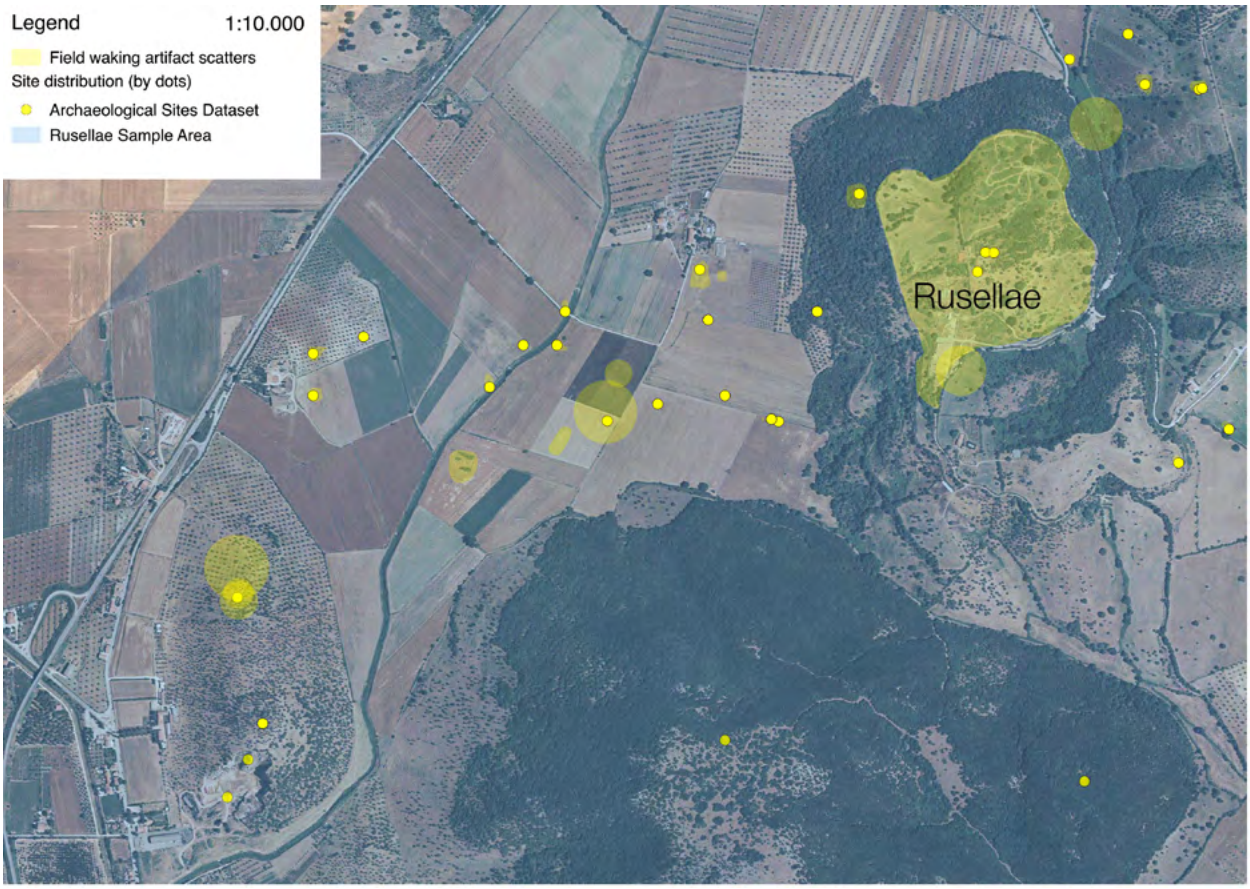


Figure 5. Close up of the distribution map of sites detected by 'traditional' archaeological survey towards the north-eastern end of the sample transect, at a scale of 1:10,000.

In the attempt to improve our understanding of the sample area we have so far collected around 400 ha of geophysical survey (370 ha of magnetic and 30 ha of resistivity data); from as long ago as 2001 we have been undertaking exploratory aerial survey in the area and more recently we have commenced fieldwork with the purpose of collecting archaeological, geo-archaeological and bio-archaeological evidence within the chosen transect. At this point, if we wish to remain consistent with the critical approach set out earlier, especially as regards the limitations of so called 'traditional' approaches to landscape archaeology based on field-walking survey, we have to ask the same questions: after this amount of scientific effort have we in fact answered our research questions? Which new scenarios have been opened up? Which new questions are we now able to ask? Has our understating of archaeological and landscape transformations within the sample area been substantially improved?

To answer these questions or at least provide a partial response, bearing in mind that the project is still in progress, the following paragraphs and illustrations will present some examples that will shed light on the present impact on our understanding of the area and the overall potential of the holistic approach developed and implemented within this study of a carefully chosen tract of ancient landscapes.

Let us start with a quantitative remark. The systematic examination of past archaeological research, documentary sources, epigraphic material, place-name evidence and historical maps, combined with a long-lasting programme of field-walking survey, has produced a substantial amount of information on the *Rusellae* area – including around 80 archaeological contexts of various kinds within the transect now undergoing more intensive study (Figure 3). However, moving from the 1:100,000 scale of Figures 3 and 4 to a more detailed representation at 1:10,000 in Figure 5, it is quite clear that even the most dense site concentration visible on 1:100,000 map displays large 'gaps' at the more detailed scale. Caution is of course needed in making comparative quantifications of the results achieved by this 'traditional' research compared with the wider range of information that can now be collected through the use of sources such as remote sensing (mainly based on aerial photography) and magnetometer and electrical resistance survey. Nevertheless, the general increase in the 'visibility' of the archaeological evidence can be seen in the fact that these latter methods have so far produced 1886 previously undetected features

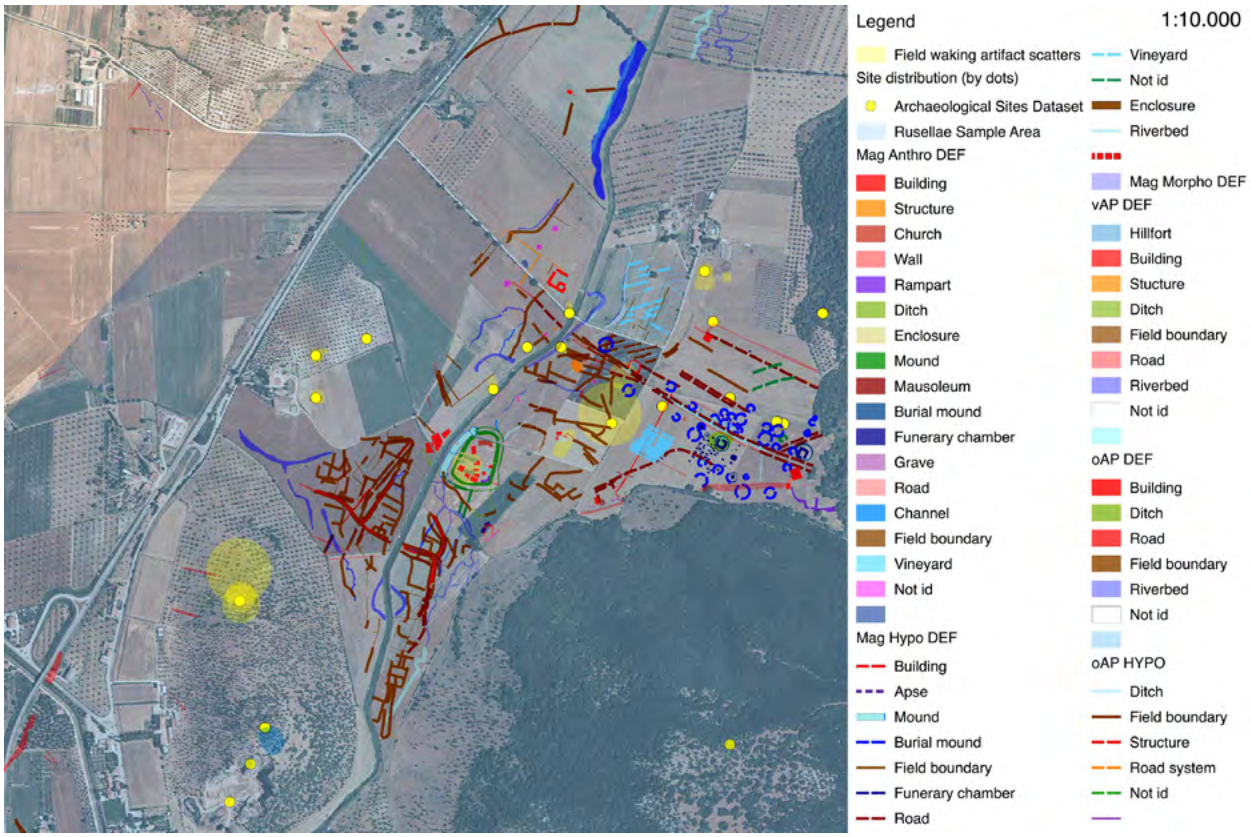


Figure 6. Overlapping of the site distribution (from Figure 5) and archaeological mapping of magnetic measurements (Mag) and oblique (oAP) and vertical (vAP) aerial photography.

within the sample transect. However, the aim here is not to make a simple comparison of numbers but rather to show that, taking all sources together, we have already collected a very substantial amount of information. With continuing survey and fieldwork we anticipate that this will soon reach what we might call a 'critical mass'. That said, we need to focus our attention not only on numbers but also on the qualitative contribution to the stated objective of holistic landscape interpretation. To illustrate the possibility of achieving that goal it might be useful to look at parts of the sample transect in closer detail, discussing some of the results achieved so far.

Archaeological interpretation of the medieval landscape

The north-eastern part of the sample transect (Figures 6-10) – At present it is possible to recognize two main blocks of the sample transect within which we have so far been able to collect large-scale contiguous magnetic data, one in the south-west and the other to the north-east (Figure 4). It will be useful to start the analysis in the north-eastern block. This is so close to the town of Rusellae that it could be viewed within the time range under consideration both as a suburban and as a rural area.

Aerial survey but especially magnetic prospection has thrown up entirely unexpected results. For instance, close below *Rusellae* itself, in an area of superficially undistinctive arable landscape, there is clearly visible in Figures 6 and 7 a mass of magnetic features representing a major road connecting the countryside with the city; this is around 6 m wide at the bottom of the slope but known to expand to a width of 14 m wide as it approaches the city itself. Along both sides of this road the magnetic data shows a dense concentration of ring-ditches and rectangular anomalies that can without doubt be interpreted as burials, in effect the remains of a major cemetery probably dating to both the Etruscan and Roman periods. At present 34 ring-ditches and 37 rectangular anomalies have been recognized and mapped. The ring-ditches range from 13 m to 43 m in diameter and an average of 19 m while the square features are more standardised at about 4 m *by* 6 m. On the basis of comparative studies on other Italian contexts such as Cerveteri (Tartara 2003: 157-166) this is clearly a major and previously unsuspected funerary landscape placed along one of the main roads entering and leaving the city of *Rusellae*. Moreover on the southern (lower) edge of the Figure 7 it is possible to recognize another road and a quite peculiar structure showing as a round anomaly surrounded by a square of opposite magnetic polarity; the shape, articulation and

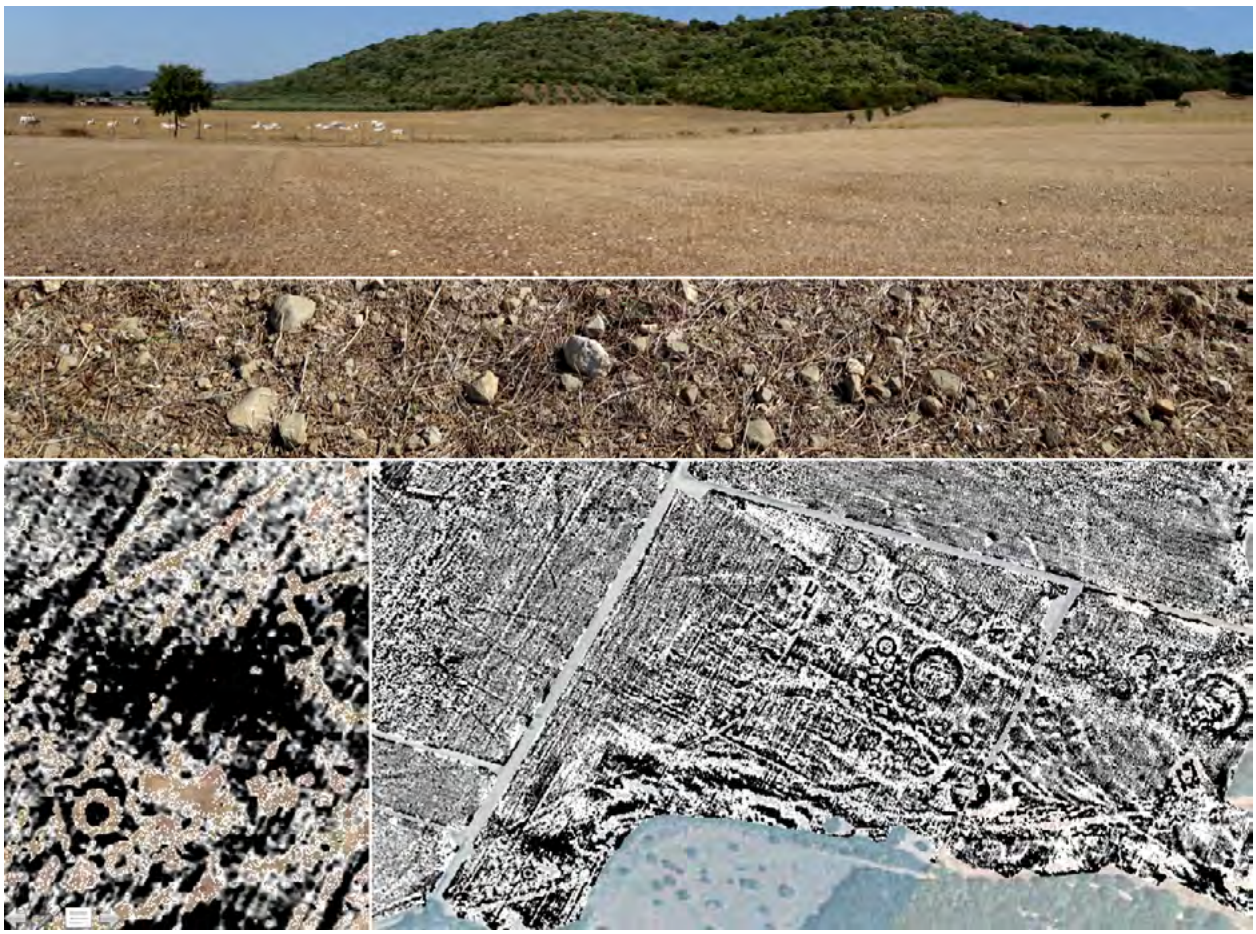


Figure 7. Geophysical data from the north-eastern part of the sample transect. From the upper left corner: general overview of the area; picture of the soil showing the extremely low concentration of artefact scatters; detail of the magnetic map showing the features interpreted as a possible mausoleum; general overview of the magnetic map displaying the large number of ring-ditches and square anomalies interpreted as a major cemetery lining either side of a road connecting the city of Rusellae to the surrounding countryside. The conjectured mausoleum appears at small scale in the bottom left corner of the lower-right map.

size of this feature finds a convincing parallel in Roman mausolea (Johnson 2014).

If these interpretation were to be confirmed by excavation it would be possible to envisage an interesting scenario of a funerary landscape that with some slight changes might show continuity across a long time span from around the 7th to 6th centuries BC and on into the Roman period. This kind of continuity would be particularly interesting bearing in mind the various changes in the internal structure of the city between the Etruscan, Republican and Imperial phases of its development. Significantly, but surprisingly in the light of this very striking geophysical evidence, neither micro-morphological evidence nor field-walking survey in the past or in the summer of 2015 (apart from a very limited scatter of mainly off-site material) presented any interpretable evidence of this kind of road system or long-lasting funerary landscape.

Moving to a few hundred metres to the south-west within this part of the sample transect it is interesting to notice in Figures 8 to 10 how dataset continuity corresponds to feature continuity in terms of the differing kinds of evidence relating to differing activities and diverse time frames. Indeed, the magnetic data shows a dense concentration of anomalies that can be readily interpreted as man-made functional elements and natural features within the local landscape: field systems, cultivation patterns, road systems, buildings, geomorphological features and so on. However, it may be profitable in the first instance to focus attention on a double-ditched enclosure alongside the river Salica, marked in green in Figures 8 and 9.

This feature was first identified in magnetic data and then confirmed during field-walking survey. The magnetic data shows quite clearly a double-ditched enclosure with an internal area of about 0.8 ha and an overall area including the ditches of 1.63 ha. In the central enclosure it is possible to recognize several

magnetic anomalies that coincide with artefact scatters, their size and shape suggesting interpretation as buildings. The larger size and east-west orientation of one of these, on the northern side of the enclosure, may well invite interpretation as a church. In this case field observation and artefact collection were very important in identifying a key feature of the site: a significant variation in elevation (of as much as 1.5 m) matching the features visible on the magnetic map. Putting the two types of evidence together the result is fairly obvious: an artificial mound or alternatively a ditched enclosure occupying a natural area of slightly higher land in the local topography. Moreover, in the neighbourhood of the site, but mostly west of the present course of the river Salica, magnetic anomalies reveals a dense pattern of field boundaries, roads and palaeo-riverbeds.

The outstanding character of the magnetic data and local topography prompted a decision to implement a borehole survey and an intensive programme of fieldwork based on artefact collection within a virtual grid of 10 m x 10 m 'cells'.[26] This 'targeted' fieldwork was aimed at establishing the chronological range and function of the site and at providing a more detailed picture of the match between the magnetic measurements, micromorphology and artefacts distribution. The survey and the analysis of artefacts set out in Table 1 show a quite distinct pattern of intensive anthropic activity corresponding with the micro-morphological and magnetic evidence and deriving predominantly from the early 10th to early or mid 12th centuries AD. On the basis comparative studies of shape, size, morphology, artefact assemblage and chronological range this site can confidently be interpreted as a medieval mound settlement that in significant respects resembles others identified in recent years within the landscape of the Grosseto lowland.[27]

Moreover, it is interesting to consider the possibility that the field and road systems in the immediate vicinity could be associated with the same cultural context and chronological range. It is noticeable that the parcels within the field system are characterized by a relatively consistent pattern of size, shape and boundary-type. The boundaries were clearly ditches which would have been used both to divide the land into functional sub-units and to provide indispensable drainage for arable land close against to the river Salica.

Period	Number of cell grid with pottery
7th-6th B.C.	19
Mid 3rd-mid 1st B.C.	17
Late 1st B.C.-1st A.D.	10
2nd-3rd A.D.	1
4th-5th A.D.	3
6th-7th A.D.	3
8th-9th A.D.	12
Early 10th-early/mid 12th	218

Table 1. Quantification and chronological distribution by grid cells of datable material recovered during artefact collection.

The borehole survey undertaken in the summer of 2015 made it possible to distinguish stratigraphic layers, which could be cautiously associated with the filling of agricultural boundary ditches but unfortunately no dating evidence could be identified. Bureaucratic difficulties prevented implementation of the intended programme of test excavations but thanks to the support and collaboration of the Toscana Superintendency we expect to overcome these problems for the following years.[28] However, a comparative study based of size, shape and relationship with the settlement tends to support the interpretation as a medieval settlement and related field system. Among better-known case-studies in Italy, the Tavoliere in Puglia presents some very close parallels thanks to the effectiveness of aerial photography in that area: Casone San Severo, Motta della Regina, Masseria Petrullo and San Lorenzo in Carmignano all display a quite close resemblance in general appearance to our field system in terms of size, shape and overall pattern, and in some cases also to the shape of the settlement itself (Guaitoli 2003: 106-119).

It is interesting to compare the field pattern under investigation with the cadastral map of the Grand Duchy of Tuscany surveyed in 1817-1830 (Figure 8). Even at first glance it appears clear that the field patterns in the cadastral maps of this area (as well in the rest of the sample transect) are much closer to those of the present day, with almost no links with the patterns identified in the magnetic measurements.

As already mentioned above and illustrated in Figure 9, two similar mounds similarly ditched enclosures have been located in recent years within the 25 km^2 area of the sample transect, 10 km^2 of which consists largely of wooded upland and the rest of valley lowland, including 4 km^2 so far subjected to

[26] For the method of artefact collection within a virtual grid see Campana 2005 and Campana, Francovich 2007.

[27] Within the *Rusellae* sample transect there are two other sites with the same basic characteristics, one close to Aiali and the other at Commendone. Along the coast in the area between Scarlino and Follonica two other medieval settlements of the same kind have been identified and are currently under investigation (Campana 2009; Campana *et al.* 2009; Marasco 2013).

[28] The present picture definitively needs to be improved by test excavation and further investigation, with particular regard to radiocarbon dating, pollen analysis and geo-archaeological survey (artificial mound or a natural area of slightly higher land in the local topography?) for the medieval mound settlement and adjacent field system.

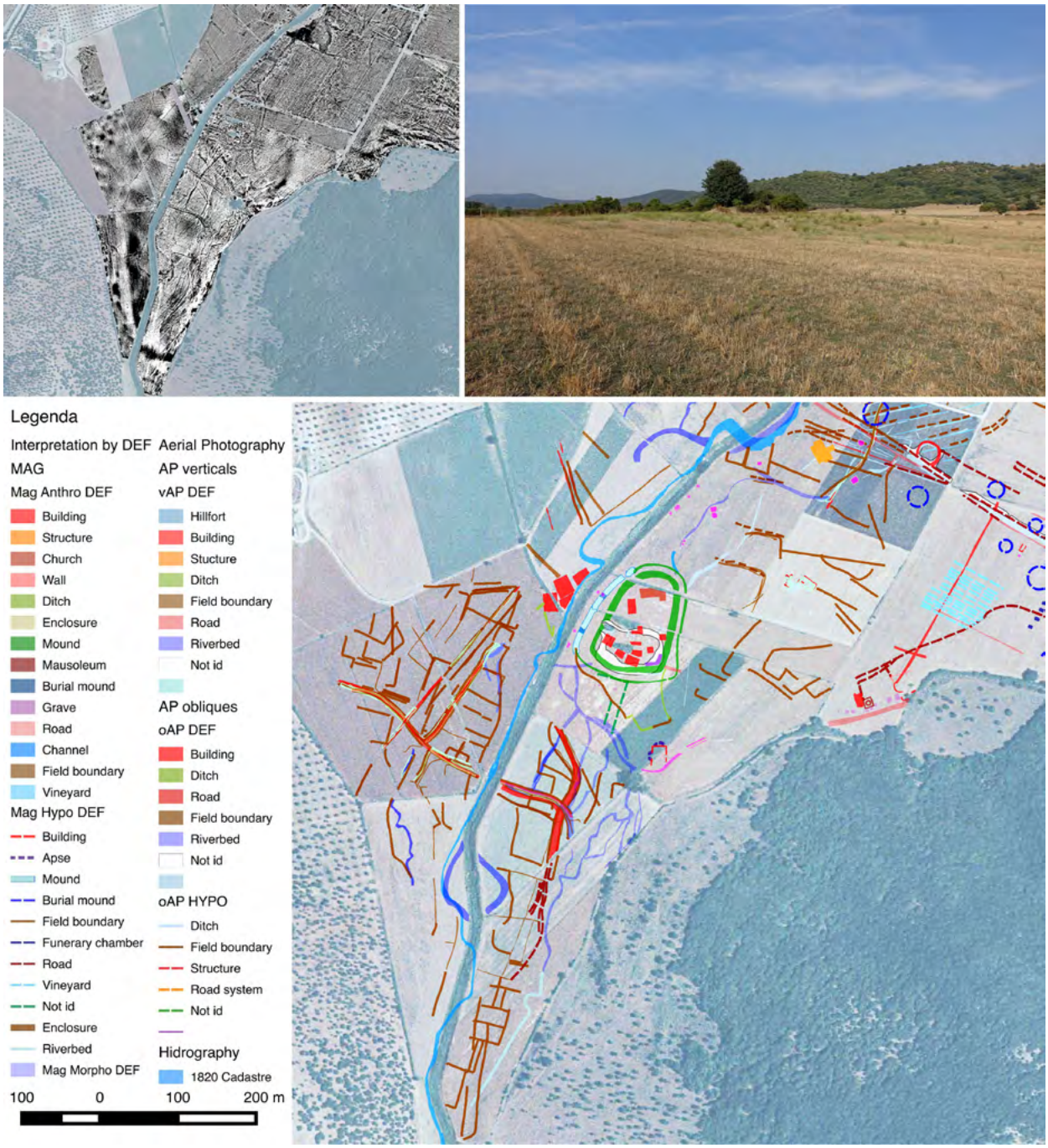


Figure 8. The mound double-ditched enclosure at La Canonica. From the upper left corner: general overview of the area showing the magnetic measurements; ground-level view of the site morphology; mapping of the archaeological and geomorphological features including the double-ditched enclosure and its internal features along with geomorphology and the pattern of road and field systems.

intensive survey. This represents a density of one such settlement for each 1.3 km^2 of the intensively surveyed area. It is accepted, of course, that a larger area of the landscape will need to be covered by this kind of survey before such a statistic begins to become truly meaningful. Nevertheless the identification of these lowland medieval settlements is significant in the sense that over the past 40 years the archaeological development of Tuscany during this formative period of history has been intensively studied by excavation and traditional field-walking survey, notably by archaeologists from the University of Siena, especially under the leadership of late Prof Riccardo Francovich. A key concept resulting from this work has been the long-term development of hilltop villages (Francovich and Hodges 2003). Despite all of this work very few settlements of any kind had been identified in lowland Tuscany before 2005, and none of the type

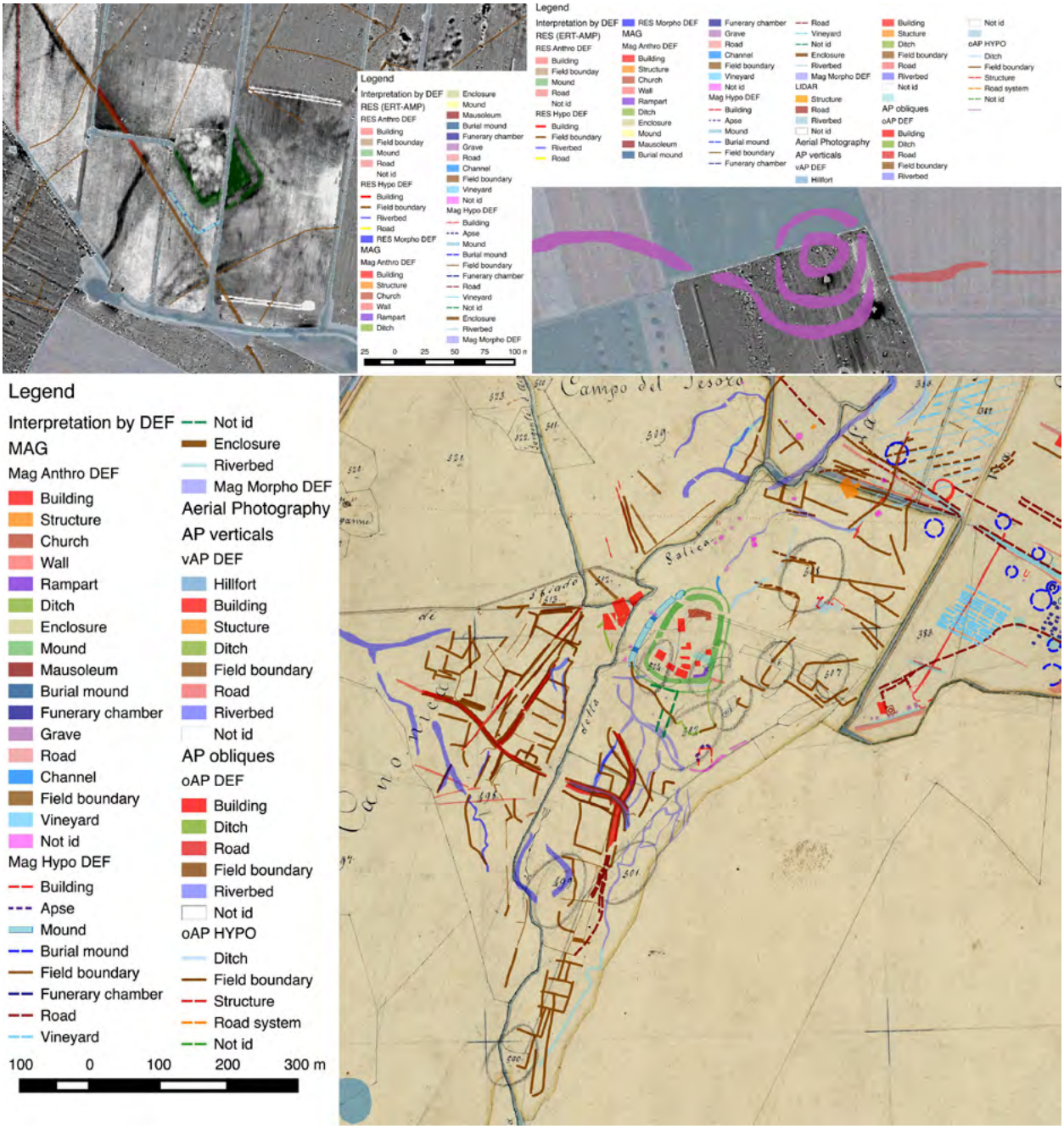


Figure 9. Mounds Ditched settlements within the Rusellae sample transect. Top left, Brancalete, close to Aiali; top right, circular settlement; bottom, superimposition of the features mapped by archaeological interpretation of magnetic data (ditched settlement, road and field systems) alongside the Salicariver and aerial survey on the historical cadastral map of 1817-1830.

now coming to light in the *Rusellae* area (Campana *et al.* 2006; Vaccaro 2012).

The detailed reasons for this have already been discussed in the introduction to this article as well as elsewhere (Campana 2009). However, the discovery of this unexpected category of settlement is bound to stimulate discussion on how to integrate this new information into the historical concepts of 'incastallemento' in ways that will improve our understanding of landscape transformations in the centuries between Late Antiquity and the mature Middle Ages, not least in the interplay between the strength and strategies of the ruling classes and the continuing existence of functioning communities and settlement patterns within the Tuscan countryside (Bianchi 2015).[29]

[29] Recently, debate on this topic has been stimulated in Italy by the work of Settia *et al.* (2013) and Creighton (2012). Unfortunately much of the resulting discussion has been focused on the particularities of this kind of settlement rather than on the broader landscape as a cultural eco-system.

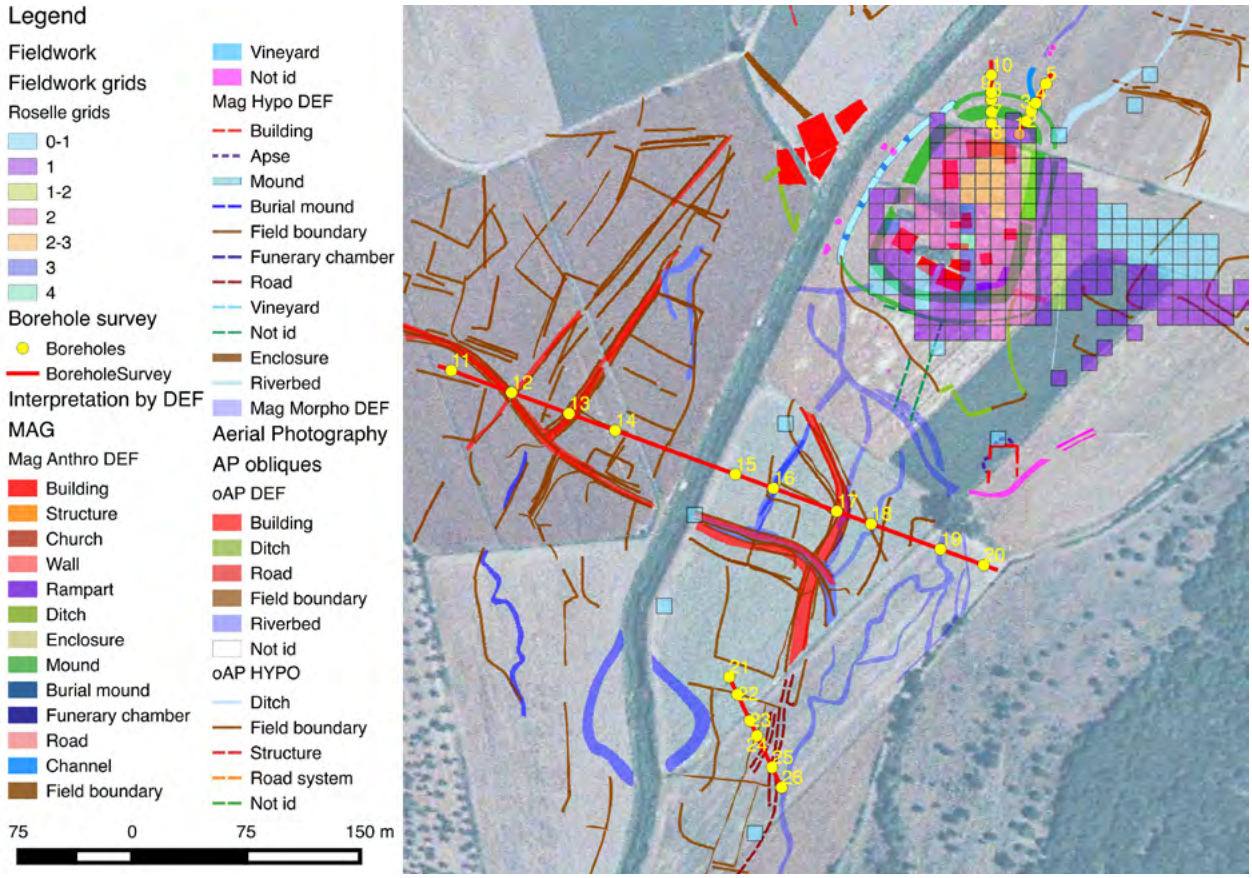
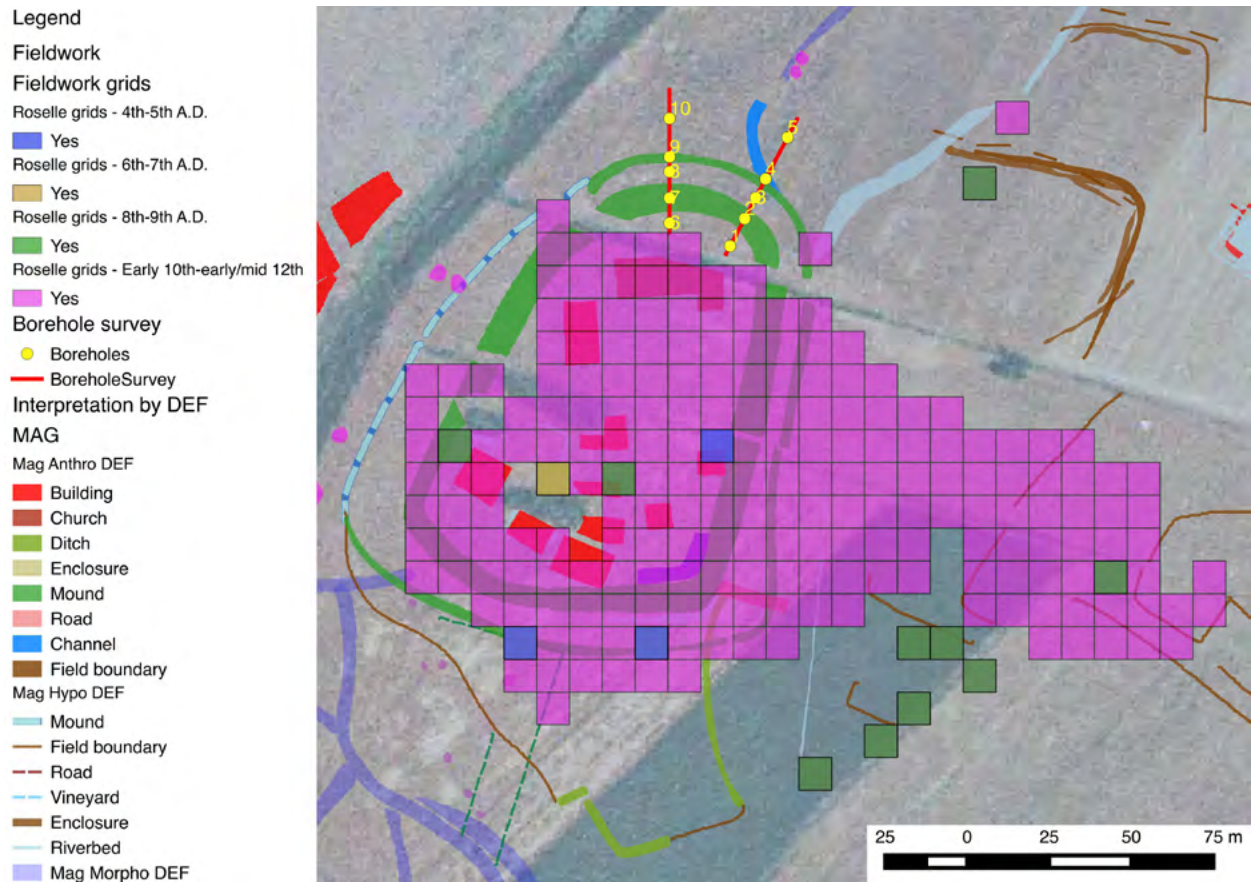


Figure 10. The double ditched settlement at La Canonica. From the top: total density plot of surface artefacts in sherds per grid cell collected during field-walking and borehole survey; distribution of artefact scatters across time, from late antiquity to the late early 10th-early/mid 12th centuries AD.



Returning to the enclosure alongside the river Salica, the magnetic measurements reveal the general shape and size of the settlement, along with several conjectured buildings within it, while the artefacts from surface collection offer a chronological overview through the density and topographical distribution of the finds. On this basis we can envisage a new scenario for landscape transformation in this immediate area. The close match between the pottery distribution and the magnetic data for the ditches and interior of the enclosure prompts interpretation of the settlement as perhaps the result of at least two different processes (Figure 10). If we interpret the presence of few early medieval sherds as residual artefacts, the mound settlement could then be considered as a new foundation of the early 10th century rather than the outcome of a longer-term process of the kind envisaged within the 'incastellamento' model (Francovich and Hodges 2003). In that case it would be possible to suppose that at this time the ruling classes invested resources in developing new settlements on the fertile lowland, perhaps moving the population from elsewhere. On the other hand, if – as the author would prefer – we interpret the presence of a small amount of early medieval pottery as deriving from a first phase of development initiated by some sort of community already living in or around this area, then the social and economic process could have been quite different. The answer to such speculation could only come from excavation, preferably on a fairly extensive scale.

However, the mound settlement and in particular the field system (assuming that their association can be confirmed by further investigation) illustrate an extraordinary vital stage of a society that had the capacity and/or need to reorganize settlement and landscape patterns, perhaps removing almost all vestiges of older patterns in the process. As a final remark in this context it is necessary to emphasize the complexity of the area under investigation. Past studies identified this as one of the most important areas within the Grosseto plain for agricultural production

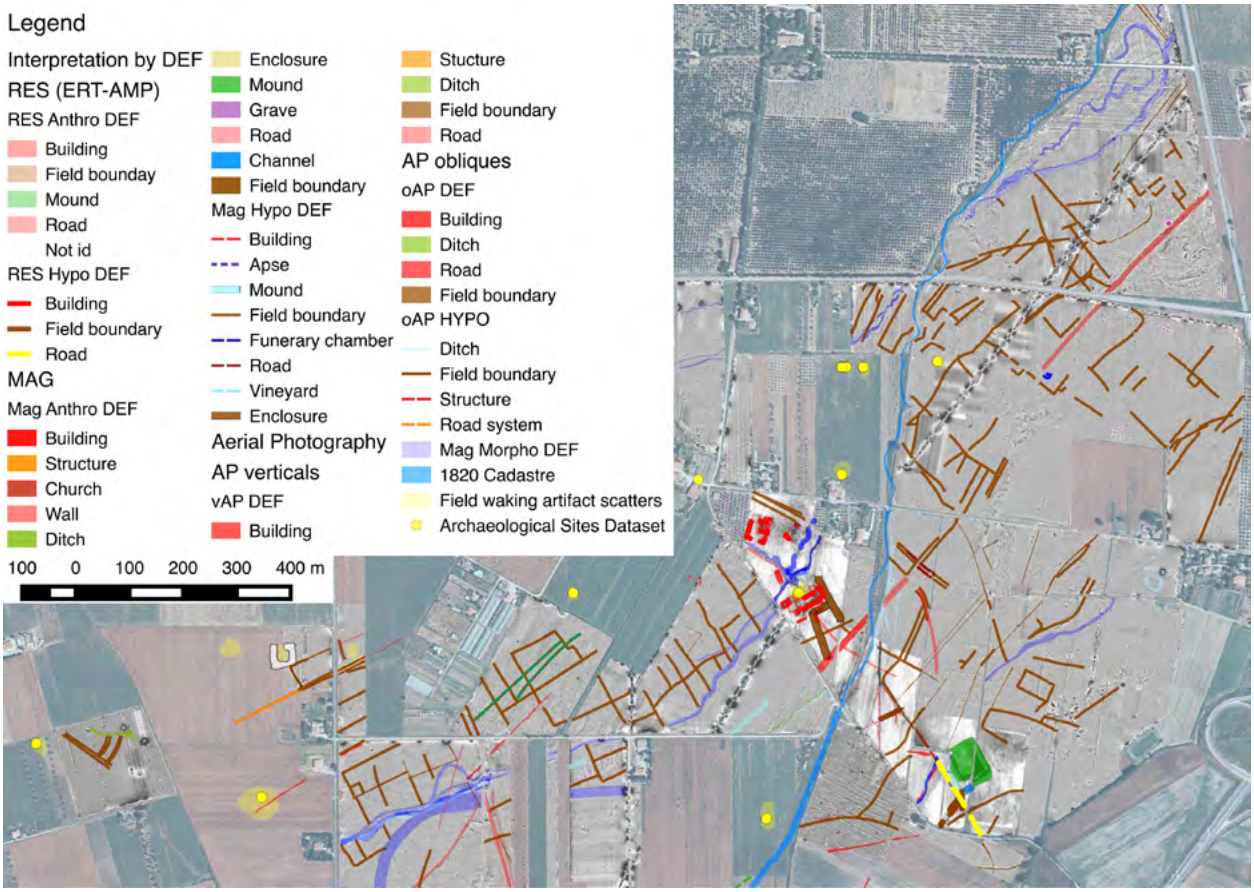


Figure 11. The south-western part of the sample transect with yellow dots to show the results of 'traditional' archaeological investigation, superimposed on integrated remote sensing data and GIS-based data mapping. The colours show the various kinds of natural and archaeological features identified so far, with red for the site of the Roman villa complex and main road at Aiali. The medieval ditched settlement at Brancalete is shown in green alongside a branch road towards the bottom right-hand corner of the figure. The quantitative and qualitative improvement in the landscape database is clearly visible, making it possible to ask, and eventually to answer, new archaeological questions about field systems, communication routes and settlement patterns as well as former water courses that may have conditioned the pattern of settlement and land-use within this local area.

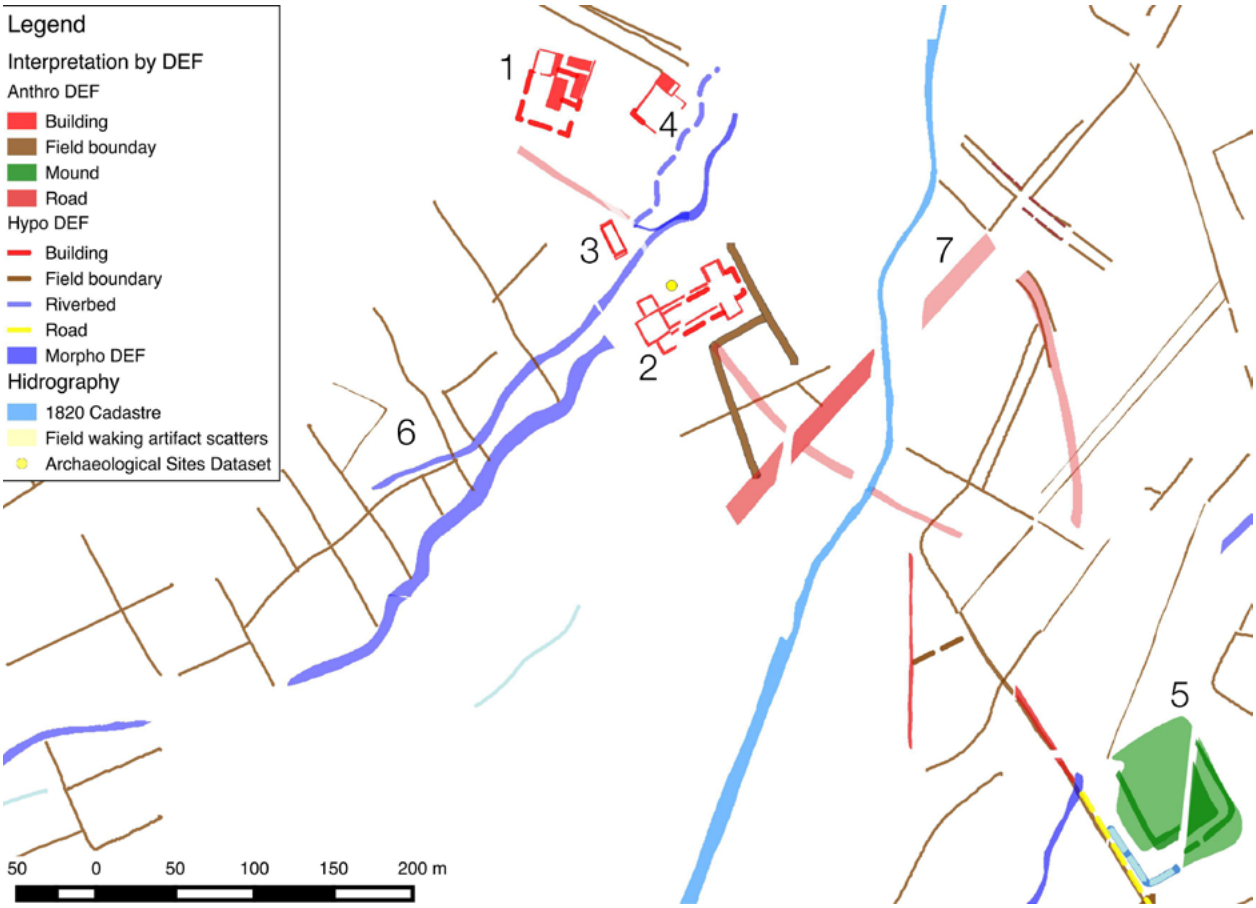


Figure 12. Extract from the south-western part of the sample transect. Close-up displaying the buildings of the Roman complex (1, 2 and 3), the ancient field system (6, matching the orientation of Roman structures 2 and 3), a medieval feature (4), and the Bracalete double-ditched medieval mound enclosure (5).

(Citter and Arnoldus 2007). However, the present phase of landscape study and the large-scale collection of remote-sensing data has produced clear evidence of a high level of hydrogeological instability in this part of the local landscape. Therefore, the creation of this new settlement and field system, whether financed initially by the ruling classes or undertaken of their own volition by an existing rural community, would have required advanced know-how of the local area, along with social resources in terms of labour and productive capacity, in order to fulfil the project in the first place and to keep it working as a viable social and productive concern over time.

The south-western part of the sample transect (Figures 11-12) – Moving further to the south-west within the sample transect we encounter the second large block of intensive landscape survey (Figures 4, 11 and 12). In this area, too, the quantitative results are remarkable. Previous surveys had identified 19 contexts (17 on-site and 2 off-site). Magnetic and electrical resistance prospection and aerial survey have now allowed us to detect a dense pattern of 883 features ranging chronologically from the Etruscan to the Middle Ages and varying from settlements to field systems, enclosures, graves, road systems, geomorphology and so forth.

In this block a particularly important complex near Aiali was identified for the first time during the Aerial Archaeology Research School held at Siena in 2001 (Musson *et al.* 2005). Oblique aerial photography on that occasion revealed a large building complex that was subsequently further investigated through intensive artefact collection, various forms of geophysical survey including high resolution radar prospection to shed light on a massive rural settlement of about 4 ha in extent, including some areas, covering a time range from the late Republic to the early Middle Age (Campana and Piro 2009).

The Roman complex, as illustrated in Figure 11 and in closer detail in Figure 12, lies either side of an apparent major road linking this area to *Rusellae* about 4 km away to the north-east. This is clearly an advantageous position within the landscape, along the *Prile* Lake, close to *Rusellae* and with the *mansio* at Hasta a further 18 km away to the south as the crow flies. Further significant features in this area include a clearly-organised and roughly grid-like field system oriented north-west

to south-east. Artefact collection across the area has provided provisional dating for buildings and other features within the complex. The southern (and later) buildings in the complex (no. 2 and 3 in Figure 12), clearly parts of a villa complex, are oriented in keeping with the field system but the northern (and earlier) building (no. 1) is not. There is also an early medieval building in much the same area (no. 4) as well as an early medieval mound ditched enclosure, rectangular in this case, a few hundred metres to the south-east (green in Figure 11; no. 5 in Figure 12). The mound ditched settlement is oriented in broad alignment with the field system, suggesting the possibility of some form of continuity in the organisation of the landscape from the Imperial Roman age to the early medieval period.

Within the field system the average size of the parcels is very close to the Roman *iugerum* or its multiples, but on the other hand the pattern is fairly uneven; as might perhaps have become the case if the system remained in use for many centuries after an original creation during the Roman period. Local historians have attempted in the past to identify a pattern of centuriation in this area but their hypothesis still awaits confirmation (Mazzolai 1960; Prisco 1998). At all events their supposed pattern does not match either the field system or other features described here. It is perhaps premature to claim, on the basis of orientation and parcel size, that the recently revealed fields represent a centuriation system set out in the mid Imperial age and remaining in use until early medieval times. For the moment the question of dating and derivation must remain unresolved, at least until test excavation or further remote sensing can provide a secure guide to the chronological range and possible extent of the field system so recently revealed.

Conclusions

What we have seen here is clearly a work in progress but further investigation – particularly test excavation and archeometric analyses – are expected to strengthen and extend the archaeological data that we have gathered so far. It is planned to increase the size of the sample area through further geophysical prospection to fill gaps and broaden the picture within the lowland (as well as through carefully structured test pitting to provide dating evidence and borehole investigation to collect samples for environmental analysis). But the thickly wooded high land will clearly not respond to this form of investigation. So as to explore this currently 'blind' area use has been planned of aerial laser scanning (high-resolution full-waveform LiDAR mounted on a UAV), making it possible to digitally 'strip away' the trees and undergrowth to expose presently-hidden sub-canopy landscapes in a way that has in the past been virtually impossible. Nevertheless, in calling for this new methodological paradigm in landscape investigation we are fully aware that it is necessary first to reach a critical mass in the quantity and quality of the data that we are able to assemble. It is worth noting that in Britain vast surveys by these methods have totally transformed archaeologists' views about almost every aspect of the past (Powlesland 2009; Neubauer *et al.* 2013).

However, the first results of the Emptyscapes project, along with the earlier work by the University of Siena, has clearly demonstrated that this kind of landscape investigation can be equally effective in the Mediterranean environment as in the UK or other parts of Europe, making the concept of exploring the archaeological *continuum* a tangible and achievable objective even in the rather different context of the Mediterranean world. Indeed, this and other research projects have demonstrated over the past few years that archaeological features in the countryside are potentially present everywhere in the Mediterranean area (Campana 2013; Keay *et al.* 2009). By the present day we can fully appreciate that an absence of past human activity seems to be the exception rather than the rule.

Focusing specifically on the medieval landscape it is worth emphasising that field-walking survey, however well conducted as a major research tool, has provided – and will continue to provide – a relatively low amount of information about settlement patterns. In the past these have for the most part been based on excavation evidence (usually from sites that are already known to exist through one form of evidence or another). In this sense current strategies of rural investigation have remained almost exclusively reactive, with a focus on the known or semi-known through the use of methodologies which reveal only a limited part of the potentially recoverable evidence. Archaeological distribution maps, at least for the early medieval centuries but in many cases even for the rest of the medieval period, still consist largely of a number of dots within a sea of 'emptiness'. Indeed, in most cases the empty spaces seem to predominate. Overcoming this limitation is the key to providing completely new opportunities for confronting important archaeological and historical topics.

The identification of unexpected and previously unknown evidence through radically revised methods of investigation is in the author's view of great importance for at least two major reasons.

The first reason is an archaeological one. The identification, for instance, of medieval mounds structured medieval settlements on the lowland cannot be looked upon as the mere addition of more dots on the map. These mounds or ditched enclosures represent a quite unexpected form of lowland settlement within Tuscany, probably beginning to appear in the later part

of the early Middle Age and continuing to proliferate during the central Middle Age (Settia *et al.* 2013). The excavation of the settlement identified at Scarlino in 2005 has tended to confirm this pattern (Marasco 2013). Well-establish archaeological concepts developed for the region for Tuscan in recent decades have pictured the lowland landscape as mostly uninhabited (Francovich and Hodges 2003). We can now see that this was probably not the case. Moreover, granted that further investigation is needed, there is a reasonable case for arguing that the ruling classes must have played some sort of role in the development and implementation of this kind of settlement structure. Or was it, as suggested earlier in this discussion, for the most part a product of initiative (or need) on the part of already-existing rural communities. If we can attain that desirable critical mass of quantitative and qualitative data we will created a new and effectiveness approach to the investigation and understanding of the medieval landscape in southern Tuscany, and by extension perhaps in other parts of Italy and even beyond.

The second reason of course lies in the methodology itself. Although the sample area currently under investigation within the Emptyscapes project is quite small, and additional research is clearly needed, (indeed, new high speed devices are currently available; Campana and Dabas 2011; Neubauer *et al.* 2013), the huge number of substantial pieces of evidence detected so far is without doubt highly impressive: a new form of aggregated medieval settlement, graves and burial mounds in a huge but previously unsuspected cemetery, field systems, an apparent mausoleum, a variety of different kind of buildings, a possible church, roads and other elements within a rural communication system – all of these have been revealed within a quite small area of superficially 'blank' landscape. Virtually none of these could have been securely defined through the traditional methods of survey and excavation that have dominated landscape archaeology in Italy until very recent times. We now have the technology, the methodological framework and the enthusiasm to bring about a change in this situation, exactly matching that brought about by a select band of forward-looking archaeologists and landscape investigators in other parts of Europe where similar intensive approaches and methodologies have been applied. We must seize this opportunity, in Italy and the rest of the Mediterranean world, to adopt these methods and challenge our present knowledge and understanding of the rural landscape.

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Human-environmental interactions in the Upper Ebro Valley (Spain): plant and animal husbandry in La Noguera (La Rioja) during the Roman and medieval periods

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Abstract

This paper focuses on the transformations of the agrarian landscape of La Noguera site (La Rioja), a Roman agrarian exploitation situated in the Upper Ebro Valley. During the Iberian Dark Ages, this establishment was part of a large estate (latifundium) whose economy was based on plant and animal husbandry. The site was later the see of a Medieval monastic community and, finally, a Cistercian farm. The complex historical processes that took place in the territory exploited by the inhabitants of La Noguera demands an interdisciplinary approach in order to fully appreciate its multiple facets. The text describes the stratigraphy of the site and explores the range of human environmental interactions through the analysis of plant (seeds and fruits) and animal remains in an attempt to contribute to a better understanding of human-environment interactions in this region.

Keywords: archaeobotany, zooarchaeology, stratigraphy, human-environment interactions

Introduction

Recent decades have witnessed a remarkable advance in the approaches and methodologies applied to the study of past landscapes. Some of these developments are related to the on-going revolution in digital technologies and the integration of environmental data in landscape studies. Within this framework, current environmental proxies used in prehistoric research are becoming tools increasingly utilized by researchers working in more recent times. As a consequence, a wide number of disciplines related to archaeobiology (archaeobotany, zooarchaeology, geoarchaeology, palaeogenetics, etc) have started to be used by archaeologists working in historical periods. Moreover, the growing sophistication of approaches for understanding human-environmental interactions is, in turn, promoting a high degree of specialization within disciplines which is contributing to narrowing the focus of research.

These analytical advances have produced an explosion of new information that is challenging traditional ways of looking at past landscapes while researchers working particularly in the Mediterranean region are just beginning to realize the potential of these newly available analytic tools which provide a window into the various processes involved in the interaction between humans and the surrounding environment. In particular, the archaeobiological sciences have a valuable role to play in providing greater time depth to landscape studies and improving our understanding of the complex human-environment interactions that occurred in the past.

This paper focuses on the agrarian landscape of a small area of the Upper Ebro Valley, and more precisely, on the small farm of La Noguera. Through the analysis of its archaeological features and the study of the plant and animal remains recovered from the various occupation phases (Roman-Medieval-Modern and Contemporary periods) of the site we hope to contribute to a better understanding of human-environment interactions in this region.

The project and the site

The archaeological project was supported and it is currently funded by the Museo Vivanco Foundation, a private enterprise winner of several prestigious awards and international recognition for its activity in the promotion of wine culture. The Foundation hosts an impressive Museum of Wine Culture, which has become an international reference for research into wine history and viticulture. La Noguera project is the result of a fruitful collaboration between researchers from the Vivanco Foundation and the Spanish National Research Council through the Archaeobiology Research Group.

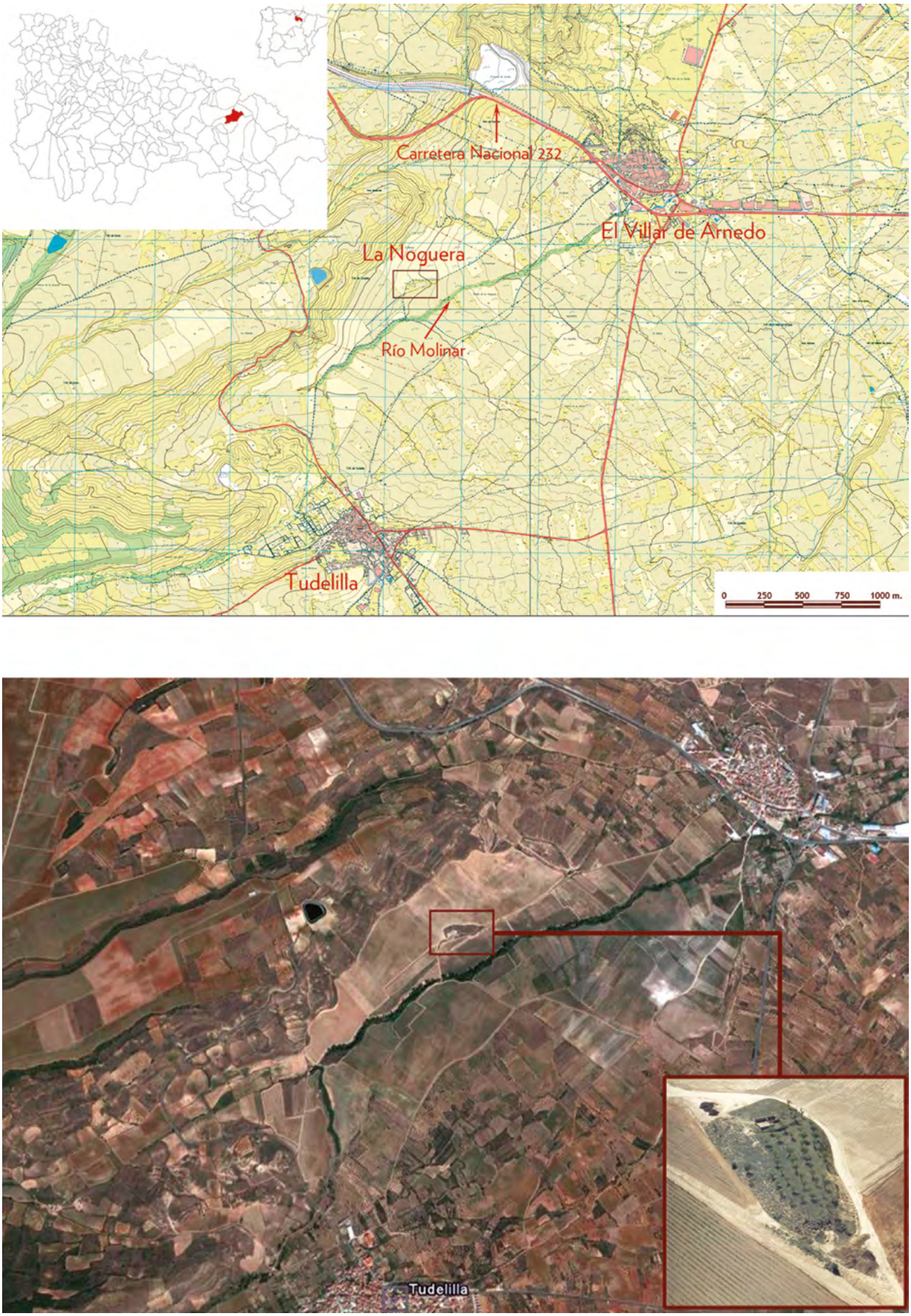


Figure 1. Location of the site and aerial photograph of San Bartolomé Hill.

The site is located in the Cerro de San Bartolomé de La Noguera (Tudelilla, La Rioja, Spain), a land property of the Museo Vivanco Foundation, which since 2002 has promoted the excavation, restoration and valorization of the archaeological remains of an area first occupied by a Roman agrarian site and later by a Cistercian farmstead (Tudanca and López de Calle 2014; 2015; Sáenz Preciado 2003, in press).

The site of La Noguera is situated in the northern part of the Iberian Peninsula, in La Rioja, the smallest Spanish autonomous region, which spreads its territory across the various mountain ranges of the Iberian System situated to the south, and the Ebro River that runs across the northern part (Figure 1). The site is set in the foothills of the Sierra de Hez, half way between the summits of the Iberian System and the Ebro Valley. From its position on a modest hillock, La Noguera dominates a small alluvial valley crossed by the Molinar torrent, an occasional stream usually dry in summer that from the Sierra de Hez flows to the north vanishing into the vineyards. The surrounding area has been altered by the most recent setting of a modern vineyard that encompasses the site. However, traces of abandoned farmed terraces are still visible in the valley. Intense clearing and landfill excavations carried out to facilitate the industrial use of the vineyard have heavily modified both the surrounding traditional agrarian landscape and the topography of the area. In fact, the site of La Noguera is nowadays restricted to the hilly area where at the beginning of the 19th century a set of farming facilities, including some dedicated to wine production, were still standing. These were a property of Cistercian monks from the nearby monastery of San Prudencio de Monte Laturce situated some kilometers to the west in the Leza valley, in the present-day municipality of Clavijo.

La Noguera is a multi-period site inserted into a distinct agrarian context which shaped its rural character from the beginning of its occupation. Although activities and buildings related to the religious and funerary realms were also present, they did not alter the rural sense of the community that lived there and managed the agricultural land. This did not imply that La Noguera remained immutable. The chronological span of the site (more than a millennium and a half of occupation) suggests that it witnessed changes in both the social and population models. The original status of La Noguera as *monasteriolum* and *grangia* depending from the Santa María de Fitero monastery as it appears for the first time in the documentary sources, suggests that it was part of an organized territorial system which was different from that of previous periods. Changes in the territorial structure in northeastern Iberia, occurred after the arrival of the Cistercian order, have been already highlighted (Bolòs 2005).

This site offers an exceptional opportunity to trace back aspects rarely found in history books. Over most part of its history, La Noguera turned its back to the current urban trends and focused on its rurality. Differently from cities where archaeological research has evidenced episodes of expansion, retraction and abandonment, La Noguera is one of those places where important events were almost absent, where nobody registered anything because no one was interested in the developments taking place in such an isolated lost place. The big happenings, the birth of new worlds, the arrival of foreign cultures and the substitution of old traditions by new ones came damped to La Noguera. Here, life was about caring flocks and tending crops, a model that remained basically the same over time.

La Noguera is part of what in Spanish is called 'el campo' (the countryside), a rather vague term that has attracted little research attention in Iberia due not only to prejudices but also to the little prospect to produce information. Recent research on the archaeology of peasant communities in the Iberian Peninsula is, however, changing our perspectives and reinvigorating this field of research (Escalona 2009; Fernández Mier *et al.* 2014, Kirchner 2010, Quirós Castillo 2009; 2012; 2013; 2014; Tejerizo García 2015; Vigil-Escalera Guirado 2007; Vigil-Escalera Guirado *et al.* 2014. In this line, this paper aims to contribute to the study of peasant communities in the Upper Ebro Valley.

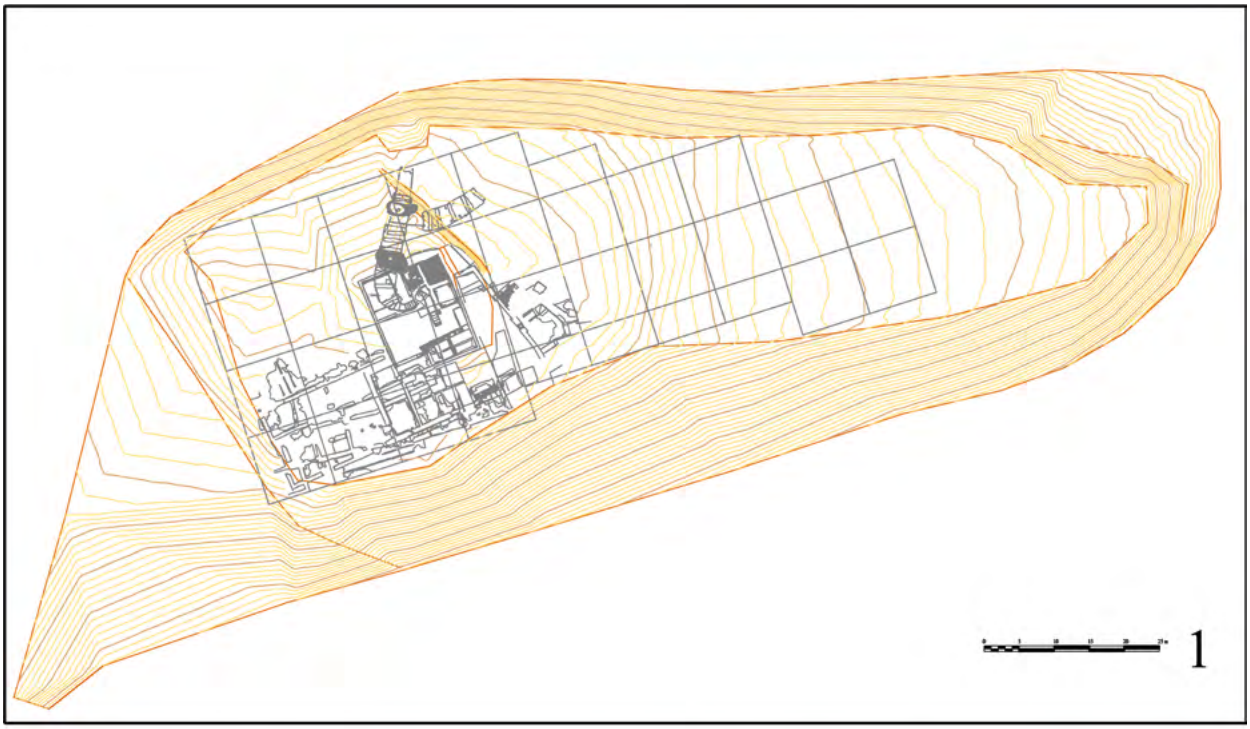
Description of the site

Spatial distribution of structures

The site of La Noguera is organized into three areas corresponding to the main chronological phases of the settlement (Figure 2).

Western area: farmstead residential and productive complexes.

In the western part of the site, most of the excavated area is occupied by the Cistercian farm of San Bartolomé. The archaeological remains of the farm consist of an inverted L-shaped structure surrounded by two paved roads and three excavated cellars. The construction comprises both the rooms of the residential area and various productive spaces which correspond to the structures built during the 15th century once the monastery of Santa María de Fitero (Navarra) stopped its protection over La Noguera, and the property of the site was acquired by the monastery of San Prudencio de Monte Laturce. The material used in the construction was very modest (pebbles and bricks for the main walls while the internal room divisions were made using running brick bonds), and it generally showed a noticeable 'popular' character.



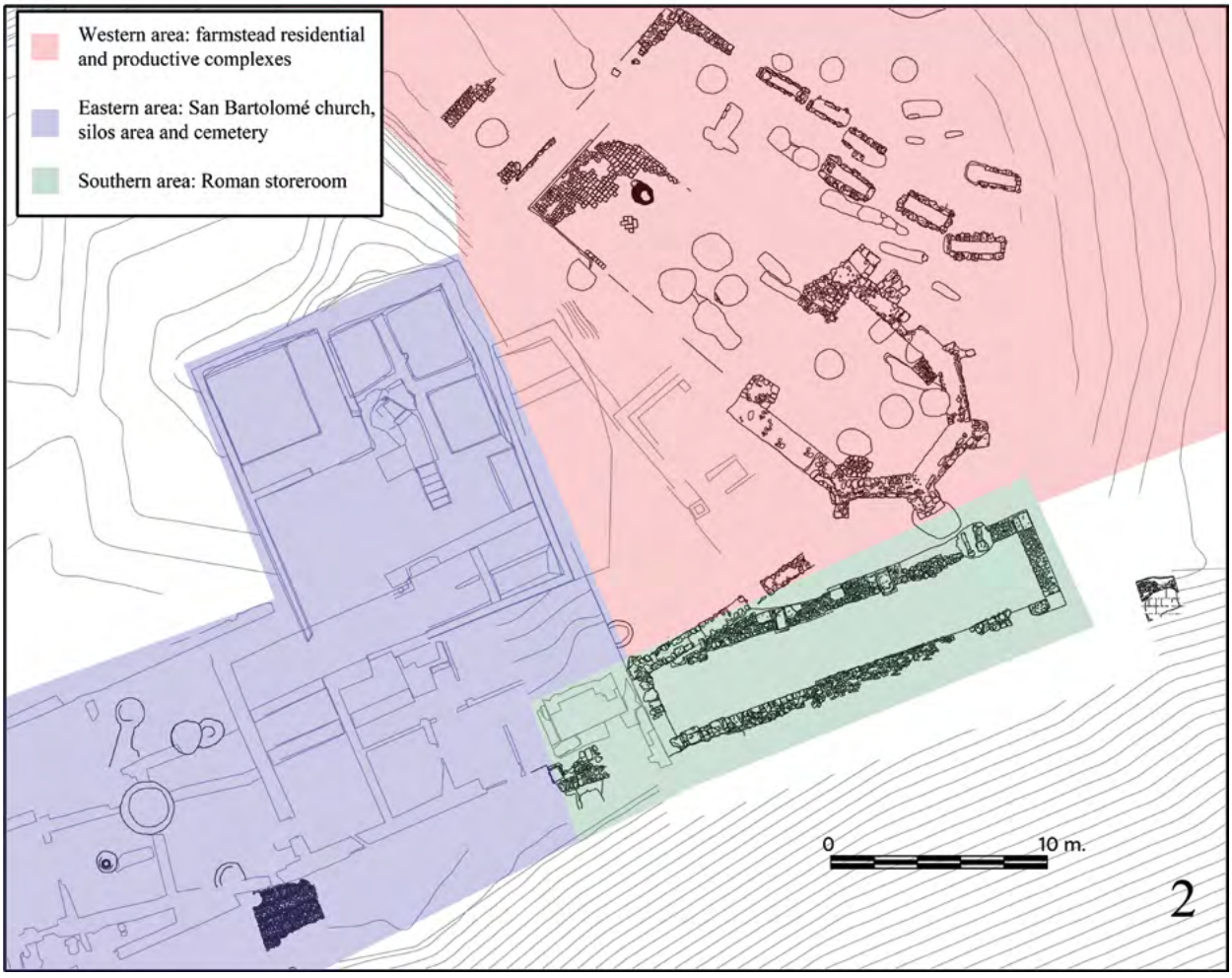


Figure 2. 1. Map of the San Bartolomé Hill. 2. Main excavated areas at La Noguera.

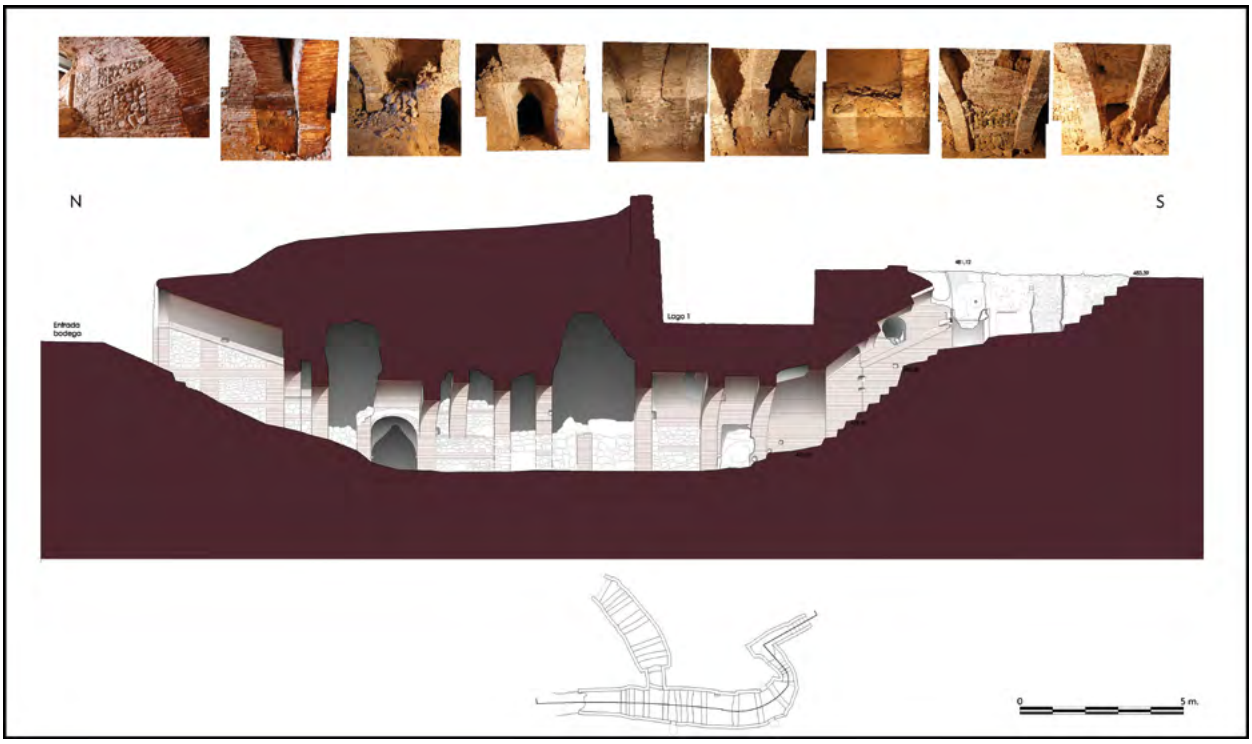


Figure 3. Section of the main cellar floor.

The eastern part of the farm was occupied by various rooms and a small oratory placed at the southeastern corner. With a rectangular floor plan, the main structure has a masonry plinth from which brick or rammed earth walls were erected. To the north of this area, the monks' residential area was attached to the winery facilities while to the south it opened to a paved road that, following the slope of the hill, led to the nearby village of Tudelilla. Showing some symmetry, the internal structure of the residential building was arranged along the axis formed by the farm hallway and the staircase that led upstairs to the friar's rooms. To the east of the axis, it was found the oratory, its small sacristy and other attached units while to the west, the various dependencies identified were probably used as cooking and storage facilities as it is suggested by the hearth and the oven discovered in one of the rooms. Further confirmation of the storage function of this western aisle comes from a passage communicating one of the rooms of the residential building to the adjacent building used as barn and storage area.

Warehouses and subsidiary units were located to the west, attached to the residential building, and bordering to the south with the paved road to the village of Tudelilla. This rectangular-shaped space, devoted to storage and stables, is divided into large compartments coarsely paved according to the type of activities carried out here. Both the residential and the industrial areas were communicated through a paved patio probably roofless, located to the north of the residential area, bordering with an installation dedicated to the production of wine (Figure 3). Four wine presses and an underground cellar excavated on the top of the hill, on its northern slope, have been preserved. The entrance to the cellar (at the most northern end) has almost disappeared as a consequence of land clearing activities carried out in the area. However, a narrow brick vaulted corridor going down to the main cellar floor, has been preserved. This passage was limited by pebble stone walls inserted with neat rows of bricks. The second access to the cellar is much better preserved. It is located at the opposite end, opened in the building that hosted the wine pressing rooms. This entrance is composed of a two flight stair made in bricks where the second flight is also covered by a brick barrel vault. A small deposit was installed at the stair landing which was connected to the press basins through a series of ceramic pipes.

The cellars are organized around a central body and two secondary branches (one to the east and the second to the west). This space is built using a series high (2-3 m) barrel vaults made of solid bricks leaning on transverse arches made of the same material. Most of these arches are rounded except those underneath the wine presses which are pointed. At some points, the vault brickwork shows quadrangular perforations of unknown function which could perhaps be associated to the handling of equipment and infrastructures related to winemaking.

While the archaeological material found in the sediment associated to the Cistercian farm corresponding to the period immediately after its abandonment is of little

historical and archaeological interest, the filling of the Medieval silos preserved above the floors of the farm are of great importance. Among the material recovered there were large ceramic containers, metal tools, Castilian coins from the 14th and 15th centuries, painted ceramic pitchers and jugs of the same period and probably of Moorish tradition and a large variety of Late Medieval ceramic vessels coated by a honey colour glaze. This consistent assemblage of archaeological material characterizes the transition between the Late Medieval and the Modern periods from when tin-glazed wares spread to urban markets from the 16th century onwards.

Eastern area: San Bartolomé church, silos area and cemetery

Located at the most eastern part of the excavated area, adjacent to the farm, this area incorporates a complex scenario with spaces devoted to different functions: a small church built in two phases, an area with underground pits excavated in two different periods, and a cemetery used during a long chronological period.

The cemetery

This is a very complex area where different types of burials coexisted (Figure 4). Abandoned silos were re-used for both individual and collective inhumations while, later, burials were excavated on top. This re-use and superposition suggests some kind of continuity. Superposed burials were either simple pits or proper graves limited by stone slabs or rough stones into which human bones in anatomical connection coexisted with secondary depositions originated by deliberated placement of bones during burial re-arrangement events. Based on some of the materials recovered in this area, it is likely that the cemetery started during the 7th century AD. Evidence comes from a golden ring and a bronze buckle typical from the period (Figure 5). The latest occupation of the cemetery was during the 18th century according to written sources.

Figure 5. Gold ring and bronze buckle from the Visigoth period (ca. 7 th century AD).

The church

Based on the archaeological evidence, the church of San Bartolomé was constructed in two independent

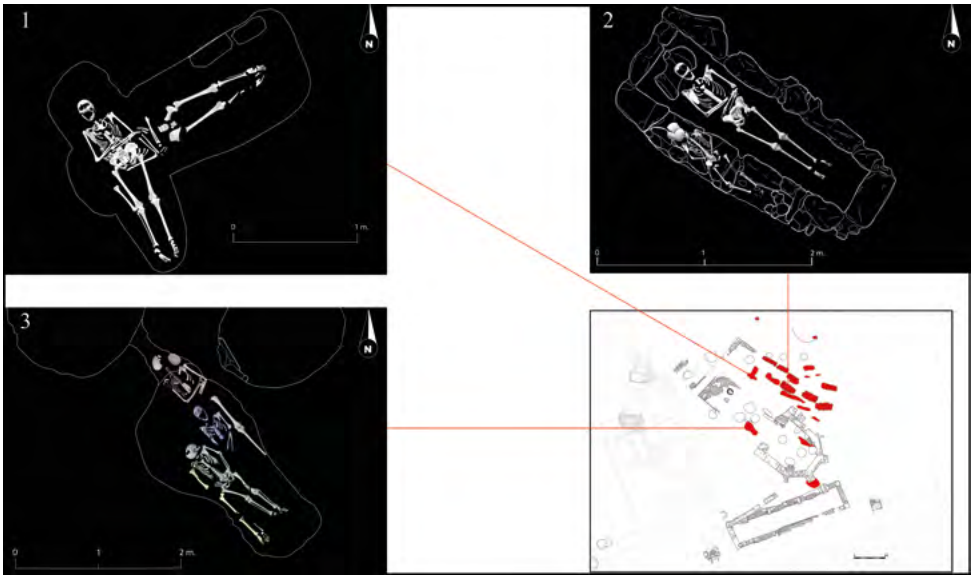


Figure 4. Different burial arrangements: 1. Superimposed tombs from two different phases 2. A possible family tomb built in rubble masonry. 3. Re-use of a silo for inhumations of different chronological periods.

phases which resulted in a building measuring 23,5 x 8,70 m. The church faces to the south east, showing a considerable deviation from the canonical orientation. This alignment does not seem to respond to particular topographical features of the site as seen today.

The head of the church is supported by a solid ashlar masonry plinth with masonry walls showing a tripartite structure filled with earth, bricks and rubble. It forms a 3-sided polygonal structure with buttresses at the angles and platforms in strategic positions which would have supported the ribs of a likely ribbed vault. This structure cuts one of the tombs indicating that the burials occupied part of this area in earlier phases and continued to do so in later periods.

On top of a platform that mitigated the irregularities of the soil, the church developed towards the northwest. The nave is limited by flimsy walls which contrast with the material used in the walls forming the head of the church. The floor was made with solid bricks, only preserved in the northern part. Here it is possible to observe the mortar base where it was placed. The bricks followed a simple pattern including squares with spike motifs still visible in the central part of the nave.

Area of underground silos

Underground silos have been recognized across the site but most of them seem to be concentrated in the eastern area (Figure 6). These underground structures ranged from cylindrical to bell-shaped. Most of the original pit mouths have disappeared as a consequence of later terracing episodes and arrangements of the area.

The greatest density of silos is found around the church but no patterns were found in their distribution. Particular alignments or specific arrangements that could support a hierarchical organization of space or diversity in their functionality or property have not been noted. The extension occupied by the storage structures is certainly bigger than the area excavated as there are still areas, particularly at the eastern part of the hill, that remain to be thoroughly investigated.

As for the fills, all of them contained a wide variety of archaeological material ranging from the Early to the Late Medieval periods.

Southern area: the Roman storeroom ('cella')

This area was occupied by a single elongated rectangular room (24,6 m long and 4,6 m wide) excavated on the natural soil of the southern side of the hill up to a depth of 1,20-1,60 m (Figure 7). The natural soil has been removed in three of the sides (west, east and north) while on the southern side only the most western part has been eliminated. A trench footing filled with pebbles runs along the entire perimeter of this singular building. The footing supports a series of structures characterized

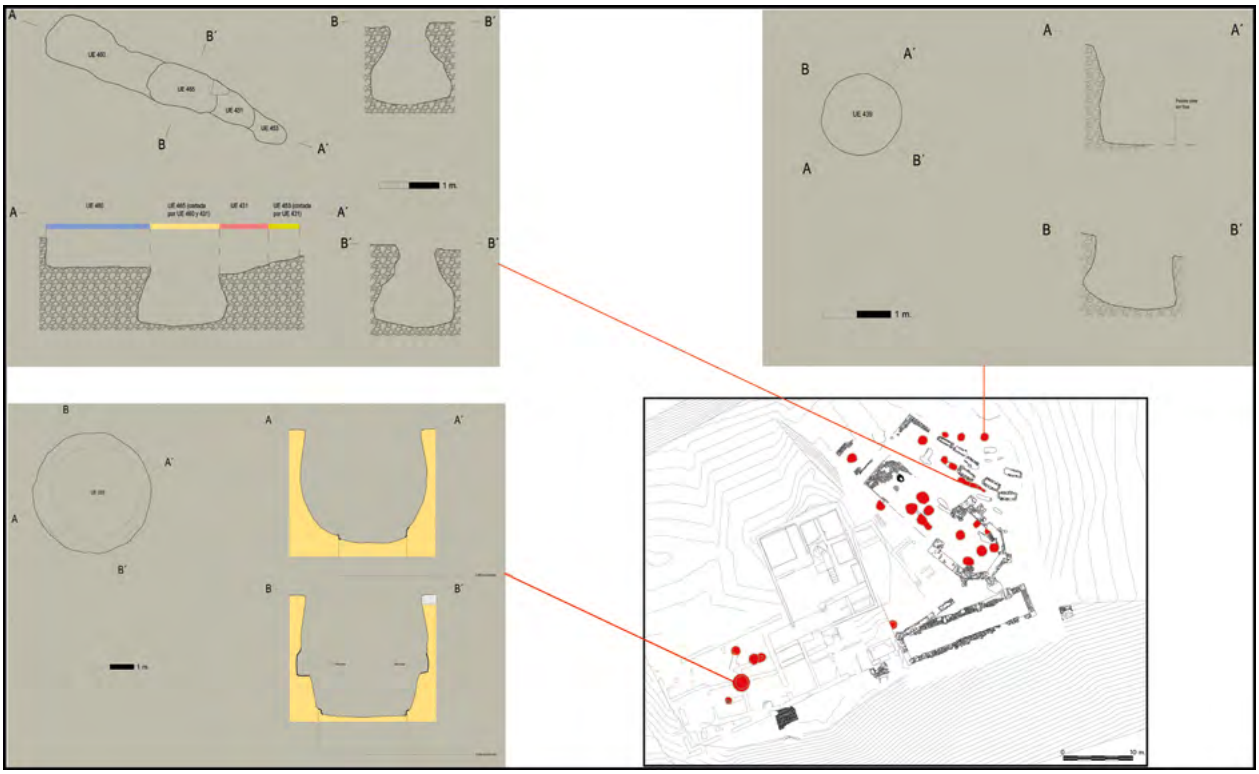


Figure 6. Map of silos distribution with some examples of sections.

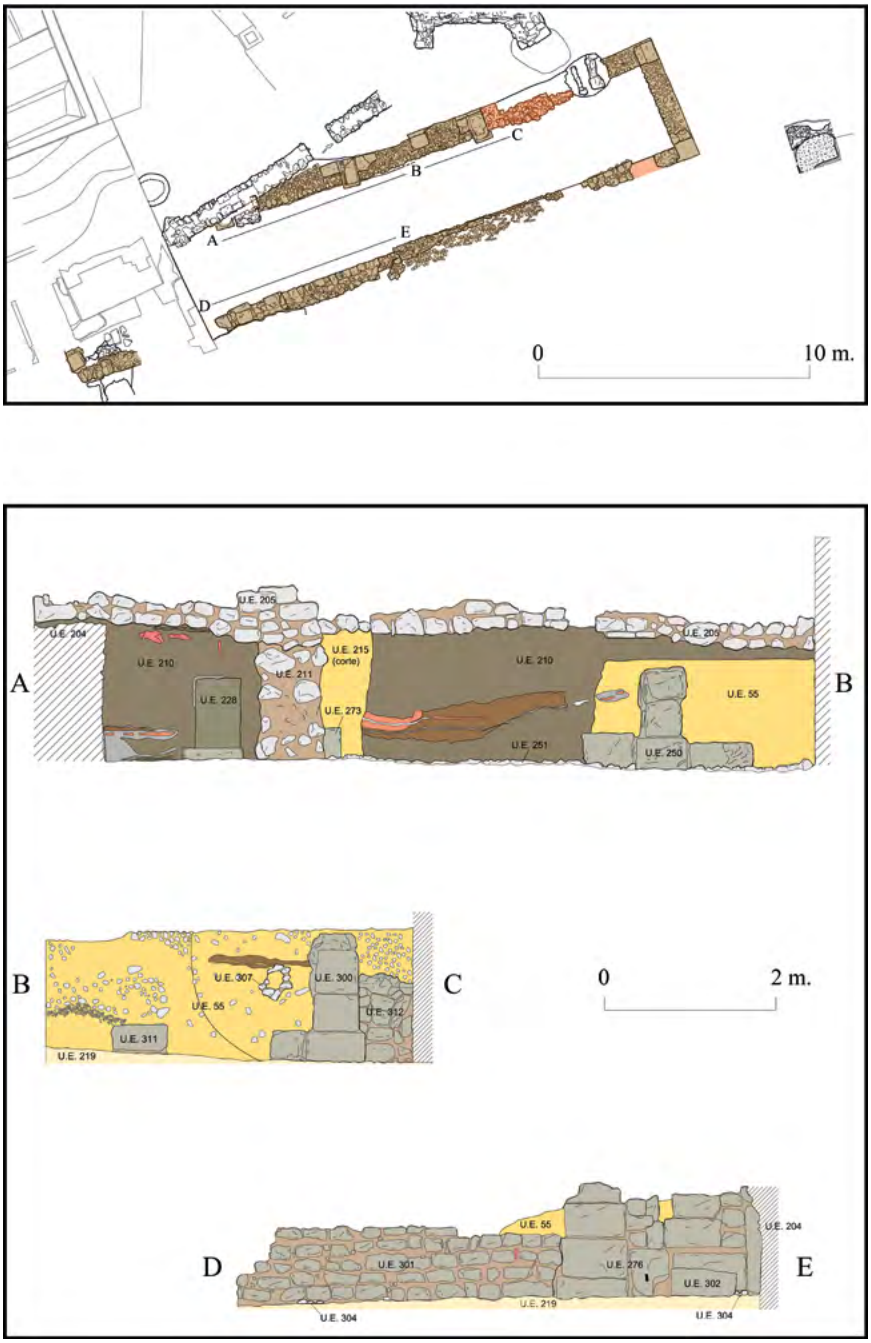


Figure 7. Floor plan and elevations of the Roma cilla.

by different construction methods which appear adapted to their position and tectonic function. In other words, sandstone masonry for the southern wall, more exposed, while a thick mud retaining wall was built in the other three sides. This has almost disappeared from their original position although remains of burnt daub were common during the excavation.

Evidence of pillars occupying the angles and the longest sides of this structure (at least one in the southern side and three in the northern side) has been found. They were made of sandstone blocks decreasing in height. The northern side has also provided a column shaft which has been probably re-used.

In its eastern half, the mud masonry wall from the southern side was a freestanding wall. Given the irregularities of the ground outside, a layer of pebbles was added to regularize it which may have also worked as drainage area.

Given the volume and characteristics of the structural elements, a second floor has been proposed but details about its features are yet unknown. However, there is no evidence other than the marks left on the large sandstone blocks, with the aim of getting a grip on the stone and facilitate lifting, that appeared abandoned inside this structure. There was also no evidence of the entrance to this storeroom neither of the connections of this structure to the remaining facilities of the farm.

This radical absence of structural remains suggests that after its abandonment, the area was probably reworked and the elements above ground destroyed.

From its fill (a mass of lumpy clay with layers of daub and ashes), it seems that the storeroom burnt, collapsed and died away into silence.

The absence of complete ceramic containers or vessels *in situ* supports the hypothesis of an abandonment of the underground space before the fire that destroyed it took place. The archaeobotanical analysis of this space suggests that, during the last phase, the Roman *cella* was a stable for domestic animals probably in use during the 3rd century AD. This chronology is supported by the time span of the archaeological material retrieved. In fact, the ceramic fragments (dolia, amphora, TSH vessels, kitchen ware, thin-walled pottery), glasses, fibulae, bone industry and coins do not go beyond this date. Moreover, there is no evidence of vessels decorated with rosettes, African wares or later coins that were so frequent from the 4th century AD in Roman sites across the Ebro Valley.

Stratigraphy

Six different stratigraphic units have been identified in La Noguera:

Level 0 corresponds to the natural substrate made of a combination of alluvial sands and gravels related to Quaternary fluvial elements from an ancient river that crossed silty tertiary deposits.

Level I is represented by the Roman farmstead from which only the excavated storeroom has been preserved. This structure is filled with the debris of a fire that destroyed it around the 3rd century AD. Levels IA and IB are related to the processes of building and abandonment of this infrastructure. Most of the archaeobiological data comes, however, from the later use of this space as stable (ovicaprine dung pellets have been recovered).

Level II is the new farmstead described in the medieval texts as *monasteriolum* and, later, from the second half of the 12th century as *grangia* depending from the Cistercian monastery of Santa María de Fitero (Navarra). Related to the second phase, a large area with underground silos and a necropolis extended over the summit of the hill has been identified. Underground pits have been often re-used as tombs but this was not always the case. The excavation has evidenced many different processes and we do not know the extent to which underground silos were in use at any one time, nor whether pits were used as burials in one or several phases after they lost their primary function as storage pits. In any case, the chronological framework spans between the 8th and the 15th centuries.

Level III is occupied by a series of productive and residential structures of a new farmstead that emerged from the reutilization of the previous structures. From the 15th century, this new farming complex was a property of the monastery of San Prudencio de Monte Laturce. Also in this period, the church of San Bartolomé, depending from the ecclesiastical council of Arnedo, was built next to the friars' residential area.

The reutilization of some of the silos (probably the largest ones) corresponds to this level.

Level IV coincides with the works carried out in the new Cistercian farm including the building of the cellars and wine presses excavated in the northern side of the site. This remodeling was also applied to the funerary activities in the San Bartolomé church.

Level V is the abandonment and ruin of both the convent grounds and the church during the first half of the 19th century as a consequence of the church disentailment in two different moments: 1813 and 1821.

According to historical and archaeological data (García Turza 1992; Gordo 2006; Moreno 1955), for almost two millennia, from the emergence of La Noguera, an event related to the territorial re-organization of the area around the Roman road and the nearby Roman city of *Calagurris Iulia Nassica*, to its abandonment in the 19th century, the inhabitants of the site developed a subsistence economy based on mixed farming and forest exploitation.

The available archaeological record is still incomplete for exploring all the contours of the historical changes and transformations that, during the Medieval and Modern periods, took place in this area of La Rioja. Instead, documentary records provide additional information suggesting that this small region was the property of the al-Andalus March given to the Cistercian order by King Alfonso VII in the 12th century. Born as a farm, the property and its resources first belonged to the Monastery of Santa María de Fitero and later, from the 15th century, to that of San Prudencio de Monte Laturce. The prior of La Noguera was a proper feudal lord with land properties extended throughout a large area between the stretch of the Ebro River in this area and the Sierra de la Hez. La Noguera was like a tiny empire, sustained by the impassive lullaby of quietness and peace and ruled by the monks and their dogma that was finally wiped out by the requirements of the new liberal society.

Divided and auctioned its properties and destroyed the farm installations, La Noguera just vanished. In its place, in the 20th century, it emerged a humble animal pen, a modest building similar to the many, almost invisible, structures that appear scattered through the landscape of this part of La Rioja.

Plant and animal remains

The archaeobotanical record

Despite the great potential of archaeobotany for exploring issues related to food production and consumption and for approaching aspects concerning agrarian practices, and therefore, studying human-environment interactions, archaeobotany has been rarely practiced in Roman and Medieval sites in the Iberian Peninsula. Contrary to the trends observed in other European countries, in most excavations from these periods sampling strategies and recovery techniques have not been applied. The delayed integration of environmental archaeology in the archaeological practice in both the Roman and Medieval periods explains to some extent the lack of studies from these periods. Thus, while in other European countries archaeobotanical studies from these periods have reached a prominent role in archaeological research (Bandini Mazzanti *et al.* 2009; Brombacher and Hecker 2015; McClatchie 2015; Rösch 2008; Ruas 2005) in Iberia, this has been deferred until recently.

A recent renovation in Iberian Medieval archaeology has permitted new developments that have transformed the way archaeology of these periods is practiced. The focus has moved to the study of agrarian landscapes (Kirchner 2010; Quirós Castillo 2014) and, in particular, to the analysis of production areas where the study of plant remains has acquired a significant role. This new environment has offered an extraordinary opportunity to explore many issues concerning agricultural production, crop processing and food in general. Recovery techniques have started to be applied and the number of studies have considerably increased over the last few years (Alonso 2005; Alonso 2010; 2014; Antolín 2014; Antolín and Alonso 2009; Kirchner 2014; Peña-Chocarro and Zapata 2005; Peña-Chocarro 2013; Teira Brión 2010; Tereso 2013a; 2013b; Vigil-Escalera Guirado 2014; Zapata and Ruiz-Alonso 2013).

This section deals with the preliminary results of the archaeobotanical study of samples from La Noguera. As the work is still on-going, more detailed information as well as a proper charcoal analysis will be included in further publications. As far as pollen analysis is concerned, several samples were taken but pollen was not preserved.

During the 2013 and 2014 field campaigns, large scale archaeobotanical sampling was carried out at the site with the aim of providing information on the range of plant foods used by the inhabitants of La Noguera and on the agricultural production of the farm.

A flotation machine was installed on site and soil samples were processed during the excavation. A total number of 61 samples were floated providing almost 3000 seeds belonging to different taxa of cultivated and wild plants (Table 1). The material comes from the three different occupation phases detected at the site spanning the Roman and the medieval period. Contexts include the Roman *cilla*, and several medieval silos.

All plant remains have been preserved by charring. Once floated, samples were dried in the open air and then stored in plastic bags. Flots were studied at the Laboratorio de Arqueobiología of the Instituto de Historia (CSIC) in Madrid. Each flot was sieved in a column of sieves with mesh sizes of 2, 1, 0,5 and 0,25 mm and the botanical remains picked from each fraction. Seeds and fruits were identified using the reference collection of the lab as well as specialized atlases. Images of some of the species identified are in Figure 8.

Cereals

La Noguera samples have produced a wide variety of cereal remains which represent the subsistence base of the economy of the site. Hulled barley (*Hordeum vulgare* subsp. *vulgare*) and free-threshing wheats (*Triticum aestivum/durum*) are the dominant species. Distinction among both species, bread wheat (*T. aestivum*) and hard wheat (*T. durum*), is only possible when rachis segments are present and this is the case of samples from La Noguera. In fact, chaff from both has been identified confirming that both were cultivated. Bread wheat chaff is more abundant during the Roman and early Medieval periods (phases I and II) while hard wheat chaff predominates in the later Medieval period (phase III). The presence of hard wheat may be related to some specialized food products as this species was often used in pasta dishes, couscous type foods, soups, etc. already known in medieval times.

Hulled wheats do not seem a dominant species although a small amount of emmer wheat (*T. dicoccum*) has been retrieved in both phase II (a tentative identification) and III. Its presence is very limited and therefore it is difficult to interpret the role of this species within the economy of the site. It could have been used either as human or animal food.

Together with free-threshing wheats barley is the most abundant species in all periods. During the Roman period it appears represented by both grains and chaff which may perhaps be related to its use as

SAN BARTOLOMÉ DE LA NOGUERA			
Phases	**I**	**II**	**III**
CULTIVATED SPECIES			
Hordeum vulgare (grain & chaff)	+	+	+
Secale cereale (grain & chaff)	+		+
Triticum aestivum-durum (grain & chaff)	+	+	+
Triticum aestivum (rachis)	+	+	+
Triticum durum (rachis)		+	+
Triticum dicoccum (grain & chaff)		+	+
Triticum sp. (grain & chaff)	+	+	+
Panicum miliaceum		+	+
Setaria italica		+	+
Lathyrus sativus/cicera		+	
Lens culinaris		+	
Vicia ervilia	+		
Vicia faba		+	+
Vicia/Lathyrus		+	+
Ficus carica		+	+
Malus domestica			+
Prunus domestica			+
Olea europaea		+	
Vitis vinifera	+	+	+
Linum sp.		+	+
WILD SPECIES			
Adonis sp.	+	+	
Ajuga sp.		+	+
Artemisia sp.	+		
Asperula arvensis	+	+	+
Atriplex sp.	+		
Avena sp.	+	+	+
Brassicaceaae	+		
Bupleurum sp.		+	
Camelina sp.		+	
Carex sp.	+	+	+
Caryophyllaceae	+	+	
Centaurea sp.		+	
Cerastium sp.	+		
Chenopodium sp.	+	+	+
Cynodon sp.		+	
Cyperaceae tp Carex		+	+
Fallopia convolvulus	+	+	
Festuca sp.	+		
Fumaria sp	+	+	+
Galium sp	+	+	
Hordeum sp. Lamiaceae	+	+	
Lavandula sp.	+		
Lithospermum officinalis	+		
Lolium sp.	+	+	+
Lolium/Festuca	+	+	+
Malva sp.	+	+	
Medicago sp.	+	+	
Melilotus sp		+	
Nicandra physaloides		+	
Pinus pinea			+
Phalaris sp.		+	
Physalis alkekengi	+		
Plantago sp.	+	+	
Poaceae	+	+	+
Polygonum aviculare	+	+	
Polygonum convolvulus		+	

SAN BARTOLOMÉ DE LA NOGUERA			
Phases	**I**	**II**	**III**
Prunus spinosa	+		
Quercus sp.		+	+
Raphanus raphanistrum		+	+
Retama tipo sphaerocarpa	+	+	
Rhamnus catharticus	+		
Rosaceae	+		
Rubiaceae		+	
Rubus sp.	+	+	
Rumex acetosella		+	
Rumex sp	+	+	
Sambucus ebulus		+	
Silene sp.	+	+	+
Sherardia sp.	+		
Solanaceae	+	+	
Solanaceae tp Physallis			+
Spergula arvensis	+		
Stipa sp.	+		
Teucrium		+	
Trifolium sp	+	+	
Valerianella dentata		+	
Verberna officinalis	+	+	
Vicia sp.	+		
Coprolite			+

Table 1. List of species (presence/absence) identified at La Noguera.

animal food. In fact, the area from where most samples from the Roman phase were taken corresponds to a possible stable for domestic animals where fodder was certainly present. In the Medieval phases, barley grains are documented in relatively high numbers but chaff is very scarce. As wheat, barley could have been also used for human food.

A fourth species represented in the Medieval samples (phase III and perhaps also in phase II) from La Noguera is rye (*Secale cereale*) a rather important winter cereal in Medieval agriculture in large parts of Europe (Behre 1992; Comet 2004) where is considered a key element in peasant diet. Although its greatest expansion occurred during the Middle Ages, its presence is also documented in earlier contexts as has been recently shown for the Iberian Peninsula (Tereso 2013b). In Spain, rye has been documented in Medieval Galicia (Antolín and Alonso 2009), Catalunya (Alonso 2010), central Iberia (Vigil-Escalera Guirado 2014) and the Basque Country (Zapata and Ruiz-Alonso 2013, Pérez-Díaz 2015) but evidence

Figure 8. Hordeum vulgare subsp. vulgare (caryopsis), 2. Hordeum vulgare (rachis), 3. Triticum aestivum-durum (caryopsis), 4. Triticum durum (rachis), 5. Setaria italica, 6. Lens culinaris, 7. Linum usitatissimum, 8. Vicia faba, 9. Malus domestica, 10. Pinus pinea, 11. Vitis vinifera, 12. Prunus domestica. Bar scale 1 mm.

is still limited and it does not seem to have played a fundamental role. This scarcity may be due to the limited assemblages of plant remains from medieval contexts.

The list of cereals found in La Noguera is completed with the addition of millet (*Panicum miliaceum*) and foxtail millet (*Setaria italica*) which have been identified in phases II and III. Archaeobotanical research has highlighted the importance of millets in European agriculture during the Middle Ages (Dembinska and Woys Weaver 1999; Castiglioni and Rottoli 2013) and their significant role in the subsistence of the less favored classes. Millets are spring crops characterized by a relatively short growing season that offered the possibility of remediating unexpected crop failures due to climatic conditions and, in some occasions, obtaining two harvests. In Iberian contexts, both species are present since prehistoric times and the archaeobotanical record confirm their importance from the Iron Age (Moreno-Larrazabal 2015). Data from the Basque Country (Zapata and Ruiz-Alonso 2013) demonstrates their role in medieval subsistence, despite texts are silent on their cultivation. Millets could be converted into bread, but in most cases they were consumed as porridge or gruels (Dembinska and Woys Weaver 1999).

A glance at the overall results indicates that the array of cultivated cereals became more diversified through time including naked and hulled wheats, hulled barley, rye, millet and foxtail millet.

Legumes

The presence of legumes in the archaeobotanical record of La Noguera is very limited as it is often the case in most archaeological contexts. The species identified are bitter vetch (*Vicia ervilia*) that has been only documented in the Roman levels and broad bean (*Vicia faba*) which appears with relatively frequency throughout the sequence. Lens (*Lens culinaris*) and possibly grass pea (Leguminosae type *Lathyrus* sp.) appear only occasionally.

Fruits

Cultivated fruits have been identified and are represented by figs (*Ficus carica*), plums (*Prunus domestica*), olives (*Olea europea*), apples (*Malus domestica*) and grapes (*Vitis vinifera*). Wild fruits such as sloe (*Prunus spinosa*), pine nuts (*Pinus pinea*), dwarf elder (*Sambucus ebulus*), acorns (*Quercus* sp.) and raspberries and blackberries (*Rubus* spp.), were probably gathered from the surrounding environment. The archaeobotanical study shows an increase in fruit diversification throughout the sequence. The only fruit species that has been documented in all periods is the grape (*Vitis vinifera*).

Oil plants

The identification of flax seeds in phases II and III suggests the possible cultivation of this species for obtaining oil as well as fibers for clothing.

Wild species

Among the samples analyzed, more than 40 different wild taxa have been identified. In many cases, the species belong to the group of arable weeds that grow in arable fields together with cereals. Relatively high numbers of seeds belonging to the grass and chenopod families were retrieved.

Agriculture in La Noguera is clearly based on the cultivation of different crops which include seven different cereals (hulled barley, bread wheat, hard wheat, emmer, rye, millet and foxtail millet), four legumes (bitter vetch, grass pea, broad bean and lentil), five different fruit species (apple, fig, grape, olive and different types of plums). Further cultivated plants include flax. Although many of them are only documented from the medieval period, it is likely that all of them were already known during Roman times and that its absence from the archaeobotanical record is related to the type of context sampled.

Cereals and legumes have been the subsistence base of human communities since prehistoric times. The species represented at La Noguera correspond to the most common crops cultivated at the time. Oats have not been identified yet although some oat caryopses have been retrieved but not identified to species level. Among the legumes, bitter vetch is the only that can be related to animal food as it is also suggested by the context from which it was retrieved. In fact, it comes from the Roman *cilla* transformed into a stable in its later phase. The variety of fruits identified highlights the importance of fruit cultivation at La Noguera, and particularly during the last phase of occupation. Fruits not only added diversity to the diet by incorporating different elements such as vitamins, sugars, minerals and fibre but they also supplemented variety. Their presence in the archaeological record of La Noguera provides evidence of existing orchards and vineyards in the farmstead.

Wild plants are represented by many plant families which include arable weeds, edible plants as well as other species which reflect the natural vegetation. Among the wild edibles pine nuts, acorns, sloe, dwarf elder and raspberries and blackberries are the most important. Other wild taxa are most probably weed from arable fields that came into the site together with the cereals. The largest number of remains belongs to the Poaceae (grass family) and from the Chenopodiaceae which include many weedy species.

There is no evidence of exotic plants (new crops, spices, etc) that characterize many of the domestic contexts from European Roman and Medieval sites. This is in accordance to the rural character of La Noguera as demonstrated by most of the archaeological remains retrieved.

The zooarchaeological record

Also, archaeologists have become aware of the important information provided by faunal remains. They represent direct evidence of the range of animals and resources that through different husbandry systems, in the case of domesticated species, were used, processed, consumed and exchanged by different social groups according to their needs and demands.

In other European countries, the frequent application of proper recovery techniques and integrated methodological approaches has led to new paradigms that demonstrate the close relationship between archeological faunal assemblages and husbanded systems and exchange networks. Moreover, faunal remains are a useful tool to explore differential uses of domestic and wild hunted resources depending on socio-economic (producer and consumers groups) and cultural status (ethnicity and religion) (Crabtree 1990; Landon 2005; O'Day *et al.* 2004; O'Connor 2010).

A review of Iberian faunal studies shows also a growing concern towards these questions (Davis 2008; Grau Sologestoa 2009; 2012; Moreno-García 2004; 2013; Vigil-Escalera 2014), although most research has focused on food consumption, in particular during the Islamic (Andalusian) period (Casal 2010; García García 2014; Martínez Sánchez 2011; Morales Muñiz *et al.* 2011; Moreno-García and Pimenta 2012; Yravedra Sainz de los Terreros 2007). In fact, for the late Middle Ages, there is a general lack of information regarding the patterns of use and consumption of animal resources despite documentary records notice the crucial socioeconomic transformations that took

SAN BARTOLOMÉ DE LA NOGUERA						
Number and percentage of vertebrate remains						
Taxa	**Level II**			**Level III**		
	N	**%**	**% det (N=218)**	**N**	**%**	**% det (N=835)**
Cattle (*Bos taurus*)	5	<1	2	11	<1	1
Sheep/Goat (*Ovis/Capra*)	185	52	85	395	26	47
[Goat (*Capra hircus*)]	[127]	[35]	[59]	[30]	[2]	[4]
[Sheep (*Ovis aries*)]	[14]	[4]	[7]	[134]	[9]	[16]
Wild boar/Pig (*Sus scrofa/dom.*)	3	<1	1	273	18	33
Red deer (*Cervus elaphus*)	13	4	6	14	1	2
Equid (*Equus sp.*)	7	2	3	3	<1	<1
Hare (*Lepus granatensis*)		-		2	<1	<1
Rabbit (*Oryctolagus cuniculus*)	5	1	2	68	4	8
Lagomorph				9	<1	
Cat (*Felis catus*)				69	4	8
Large-sized mammal	31	9		65	4	
Medium-sized mammal	100	28		540	35	
Small mammal	1	<1		30	2	
Undetermined	8	2		68	4	
TOTAL MAMMALS	358	100		1547	100	
Chicken (*Gallus domesticus*)	12			24		
Chicken/Pheasant (*Gallus/Phasianus*)				1		
Partridge (*Alectoris rufa*)	1			6		
Phasianidae undetermined				16		
Goose (*Anser sp*)				16		
Pigeon(*Columba sp*)				2		
Passeriform	1			6		
Undetermined	5			149		
TOTAL BIRDS	11			220		
TOTAL REPTILIA	1			4		
TOTAL AMPHIBIA	24			26		
TOTAL PISCIS				8		

Table 2. Number and percentage of vertebrate remains at La Noguera.

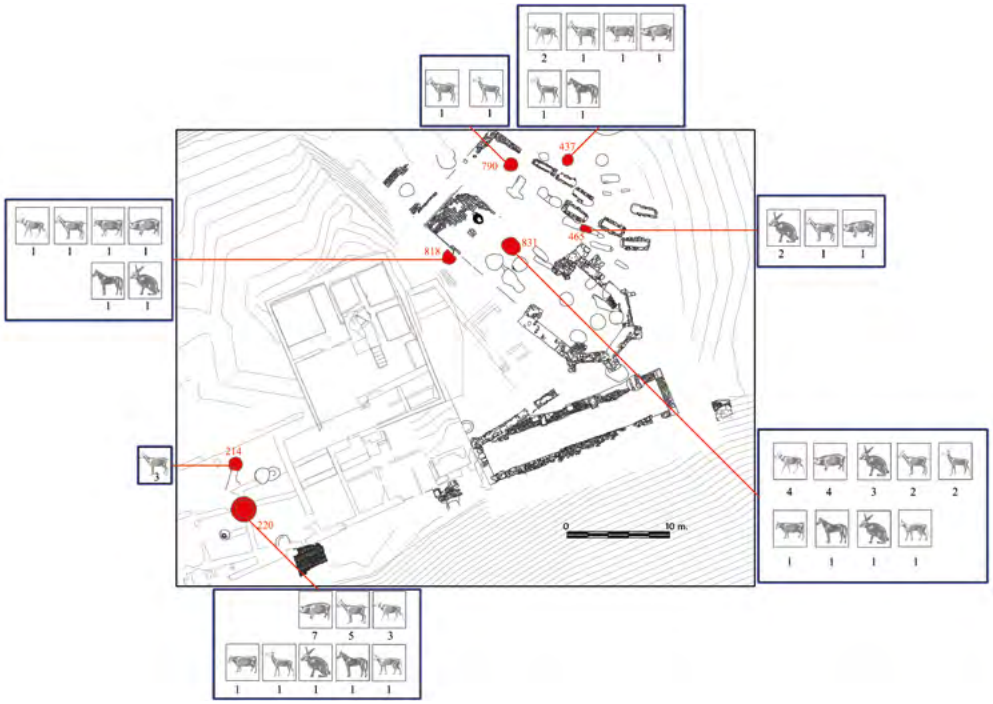


Figure 9. Minimum number of mammals in each silo.

place in these historical times that, in the case of the Iberian Peninsula, are based on the expansion of large-scale sheep transhumant movements (Klein 1920), wool production and trade (Iradiel Murugarren 1974; Rahn Phillips and Phillips 2005), and the provision of population sectors living in urban centers: traders, artisans, and so on (Carlé 1977; Puñal Fernández 1992; Banegas López 2012). Studies on the rural world and, particularly, on the articulation of rural settlements with newborn urban places are equally scarce.

The faunal remains here analyzed come from different stratigraphic units that constitute the infilling of nine silos which have not been securely radiocarbon dated yet (Table 2). The analysis of the archaeological context has allowed to distinguishing of two phases of different chronological span. While phase II appears to extend over a large time period, phase III is established more precisely by its associated material context, clearly later, and a stratigraphic position that precedes the building of the Cistercian farm. The pottery fragments from phase III, dated to the 15th-century (glazed most of them but lacking the most evolved types), are visibly different from those from the earlier level. The larger volume of the silos in this phase not only reinforces that difference but also makes us consider them as a particular assemblage (Figure 9).

Faunal remains were registered and quantified for each different stratigraphic unit. By grouping them by levels it is hoped to highlight the peculiarities of the assemblage and to show up relevant differences among levels so that the most significant trends over time are revealed. In the case of phase II, although the time span represented is larger than in phase III, the faunal assemblage has been considered as a single archaeological unit that at least now may add important information on consumed species, butchery and consumption patterns or even provide preliminary data on the economic strategies developed by the human communities responsible for the debris accumulated.

There was a systematic recovery of the faunal samples, mainly manually, over the three last fieldwork seasons. Samples coming from flotation provided few faunal remains which are of little interest.

Comparative analyses of phases II and III

Comparison of both phases clearly evidences the larger volume of material coming from phase III. Even though it contains half the number of stratigraphic units (thirteen against seven) the number of remains is nearly four times higher than in phase II. Such trend runs in parallel with a larger diversification of species in the most recent phase, regarding both mammals and birds (Table 2). The most significant outcome of these comparisons is the importance that pigs seem to have in phase III, where the frequency of birds is larger too. The occurrence of hare also in this period suggests that diet was really diversified and probably of high quality.

Taking into account these results, it is likely that remains from phase III derive from domestic refuse, while debris from the previous phase may have had a mixed origin. In general, large-sized species such as cattle, red deer and equids were more abundant in phase II, a circumstance that is confirmed by the larger proportion of remains in the artificial category of large-sized mammals. It is possible that rubbish from

different activities (i.e., mixed origin) was discarded in the silos.

Sheep and goats

In spite of the differences already described above between both phases, ovicaprids dominate the whole assemblage. The MNI of goats (5) is larger than sheep (3) in phase II, while this ratio changes in phase III, with sheep (MNI 13) dominating over goats (8). Culling profiles are no conclusive for phase II but in phase III they show that sheep were sacrificed at an old age (11 out of 13 individuals are adult). This result suggests that mixed flocks of sheep and goats were primarily kept for wool and milk production, with meat being exploited as a secondary resource. In fact such pattern agrees with goats' lowest age at death – only 3 out of 8 individuals are adult (Table 3).

Pigs

Size and morphological traits in teeth and bones are the main parameters archaeozoologists use to differentiate among similar species, such as the domestic pig and its wild ancestor the wild boar. However, in the Iberian Peninsula, data from faunal assemblages suggests a larger overlap between the biometrics of both species than in other geographical areas (Albarella. 2005; Altuna and Mariezkurrena 2011). Since the majority of suids in La Noguera are immature animals, these remains may tentatively derive from domestic pigs.

The occurrence of pig in phase II is moderate, but it constitutes the main provider of meat in the next phase with a similar percentage to ovicaprines. Such high frequency derives from the concentration of partial carcasses of piglets (six infants against one adult) which points to an intense consumption of pork in this phase, probably related to local breeding. Moreover, the consumption of piglets suggests a high quality diet. Concerning the presence of piglets, it should be borne in mind that the concentration of pig remains in a single stratigraphic unit may have been the result of an occasional event and consequently, it may bias our interpretation.

Cattle

In general, the frequency of cattle is moderate. In both phases, the age at death shows the sacrifice of sub-adult animals which is related to the primary exploitation of meat.

Equids

Equids have been included among the husbanded animals, although the management of these taxa was never oriented towards the production and use of the same resources provided by the other main domesticates. Differences in the size of some bones point out to the presence of both horses and asses, which probably played an important role as beasts of burden and in agricultural tasks.

Birds

The spatial distribution of bird remains is quite interesting since they are more abundant and diversified in phase III. To chicken (*Gallus domesticus*) and partridge (*Alectoris rufa*), a significant occurrence of geese (*Anser* sp.) and occasionally some pigeons (*Columba* sp.) should be added. All of them are considered edible species. Many fragments of immature birds that were registered just at family level (Phasianidae) probably belong to chicken.

The presence of medullary bone in a goose tibiotarsus from phase III points to the domestic nature of these birds and their local breeding. Eggshell fragments were

SAN BARTOLOMÉ DE LA NOGUERA							
Mammals. Minimum number of individuals (MNI), percentage of number of identified remains (%NRD) and percentage of MNI							
	Level II				**Level III**		
	MNI	**% NRD**	**% MNI**		**MNI**	**% NRD**	**% MNI**
Cattle (*Bos taurus*)	3	2	15		2	<1	6
Sheep/Goat (*Ovis/Capra*)	9	86	45		11	44	37
[Goat (*Capra hircus*)]	(5)	(59)	(25)		(8)	(3)	(27)
[Sheep (*Ovis aries*)]	(3)	(7)	(15)		(13)	(16)	(43)
Wild boar/Pig (*Sus scrofa/dom.*)	3	1	15		11	45	37
Red deer (*Cervus elaphus*)	3	6	15		1	2	3
Equid (*Equus* sp.)	2	3	10		1	<1	3
Hare (*Lepus granatensis*)	-	-			1	<1	3
Cat (*Felis catus*)	-	-			3	8	10
TOTAL MAMMMALS	20	N=215	100		30	N=549	100

Table 3. Mammals minimum number of individuals (MNI), percentage of number of identified remains (%NRD) and percentage of MNI from La Noguera.

recovered in both archaeological phases. They might belong to chicken and geese since juvenile specimens were recorded for both species.

Wild species

Table 2 summarizes the contribution of wild fauna in both periods. Similar proportions of red deer to cattle and suids in phase II indicate the importance of hunting activities. However, this situation changes in the next period where the occurrence of hare and birds such as partridge and pigeon suggests an interest in hunting smaller taxa.

Finally, the economic interpretation of rabbits calls for some caution since it is possible that some of their remains derive from intrusions after the abandonment of this space.

Conclusions

This work has focused on the history of human-environment interaction in the site of La Noguera over the Roman and the medieval periods. It has explored how the communities that lived in this territory adapted to its surrounding environment, and how, through different management systems, peasants exploited different resource types.

Agriculture and animal husbandry were probably the main activities carried out at the farmstead; crop fields, orchards and gardens must have been the main productive spaces although evidence in the archaeobotanical record is only provided for the first two. Remains of garden plants have not been securely identified yet. The surrounding environment did also provide with some food resources as some of the plant species identified seem to suggest.

As far as animal husbandry is concerned, data is only available from phases II and III. The faunal assemblage indicates that ovicaprids were the main animal resource of the site. The presence of sheep and goat adults suggests that these animals were actually kept as providers of wool and milk, while meat was only obtained in the latest phases of the animal's life. Other foodstuffs include pigs, and in particular piglets, pointing to a relatively high quality meat, a moderate presence of cattle, and a variety of bird species (chicken, partridge, geese and pigeons) which informs of a diversified diet.

Agriculture and animal husbandry must have had a substantial impact on the surrounding environment which at the moment cannot be fully evaluated. However, developments in our understanding of the way human communities exploited and managed plant and animal resources and on the range of foodstuffs used by each community have had huge impact on our knowledge of past societies and of its complex and changing relationship with the surrounding environment.

Recognition of the potential of archaeobiological approaches for exploring the mutual relationship between humans and environment during historical periods is an important step of the overall development of Medieval Archaeology, particularly in the context of the incipient growth of the so-called agrarian archaeology.

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The construction and dynamics of Early Medieval landscapes in central Iberia

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Abstract

Recent archaeological research in central Iberia suggests that Early Medieval landscapes were more complex than previously believed. Archaeological evidence increasingly points to a landscape characterized by a dense network of peasant hamlets and villages, intermediate power centers and cities of different sizes. As a consequence, this investigation contemplates the landscape as a dynamic construction, providing basis for a multidimensional view of the social, palaeoenvironmental and climatic processes at stake, and demonstrates that the environment and climate can be more productively included in archaeological research. The contextualization of all these elements contributes to highlight a number of aspects that are essential for understanding a stratified society, with different degrees of closeness in the vertical social relationships between peasants and elites, which had to develop a social response to the effects of the climatic crisis. Through this, evident transformations in the agroecosystem and productive structures as well as in their relationship with the new settlement pattern were developed. All of this points to a society defined by spatial inequality, a society in which elites and non-elites lived different and unequal but intertwined lives.

Keywords: Landscape Archaeology, Early Medieval, Visigothic Period, Palaeoenvironmental record, Climate Change, Early Medieval Cold Episode, Archaeozoology

Introduction[1]

In general, the archaeological interpretation of medieval landscapes and their diachronic evolution reveals complex dynamics, as shown by our project, which was carried out in the eastern area of the Iberian Meseta, covering the period between the 6th and 8th centuries. Archaeological research on this period being undertaken in Iberia provides data that emphasize and confirm the presence of a new landscape which differs from that of the previous Late Antique period. Research carried out over the last twenty years, which has involved a qualitative and quantitative leap for Spanish archaeology, has been instrumental in understanding this process. The evidence collected, especially in the central regions of the Peninsula, confirms the existence of a new landscape and social framework.

The entangled nature of landscape and social construction must be stressed in the face of the prevalent theoretical approaches, which tend to blur the outlines of the Early Medieval reality. Archaeology has explored several theoretical avenues for the analysis of the Early Middle Ages, all of which have roots in a historical-cultural paradigm which is interested in a very limited range of topics: ethnicity, the Christianization of topography and, more recently, the urban and rural worlds, the peasantry and the elites. Elsewhere we have voiced the need to overcome a dichotomy-based interpretation of history: we/the others, peasants/elites, towns/rural settlements... (Olmo-Enciso 2015: 17; 2018a: 193). These dichotomies stem from a binary perspective which responds to the premises set out by the eurocentrism implicit in the 'Western Gaze' (Bender 1999: 31-45). These constructions have contributed to create specialized fields of study, but have also been responsible for the artificial deconstruction of a complex historical reality. The current debate is mostly focused on the interpretation of social structures and their imprint upon the landscape. Thus, a landscape-based analysis of archaeological data presents the landscape as a

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dynamic social space where traditional paradigms and academic divides become less sharp. A transition between a strict periodization-based, narrative-building archaeology and the study of the landscape as a socially constructed space is, therefore, finally possible.

This investigation thus contemplates the landscape as a social construction, the examination of which is undertaken through the contextualization of all the evidence it contains. This provides the basis for a multidimensional view of the social, palaeoenvironmental and climatic processes at work, and demonstrates that the environment and climate can be more productively included in archaeological investigations. In this sense, the abandonment of the dualist paradigm, which considered nature and culture as two separate things, made possible an epistemological construction based on a shared dialectic relationship between biology and culture (McGuire 1992: 129-131; Mrozowsky 2006: 24-5). This position and its critique of the historical-cultural paradigm was based on a tradition of research which had systematically insisted upon the need to contextualize the landscape (Bender 1993: 2; 1999: 31-45) (Olmo-Enciso 2018a: 201).

The formation of a new landscape

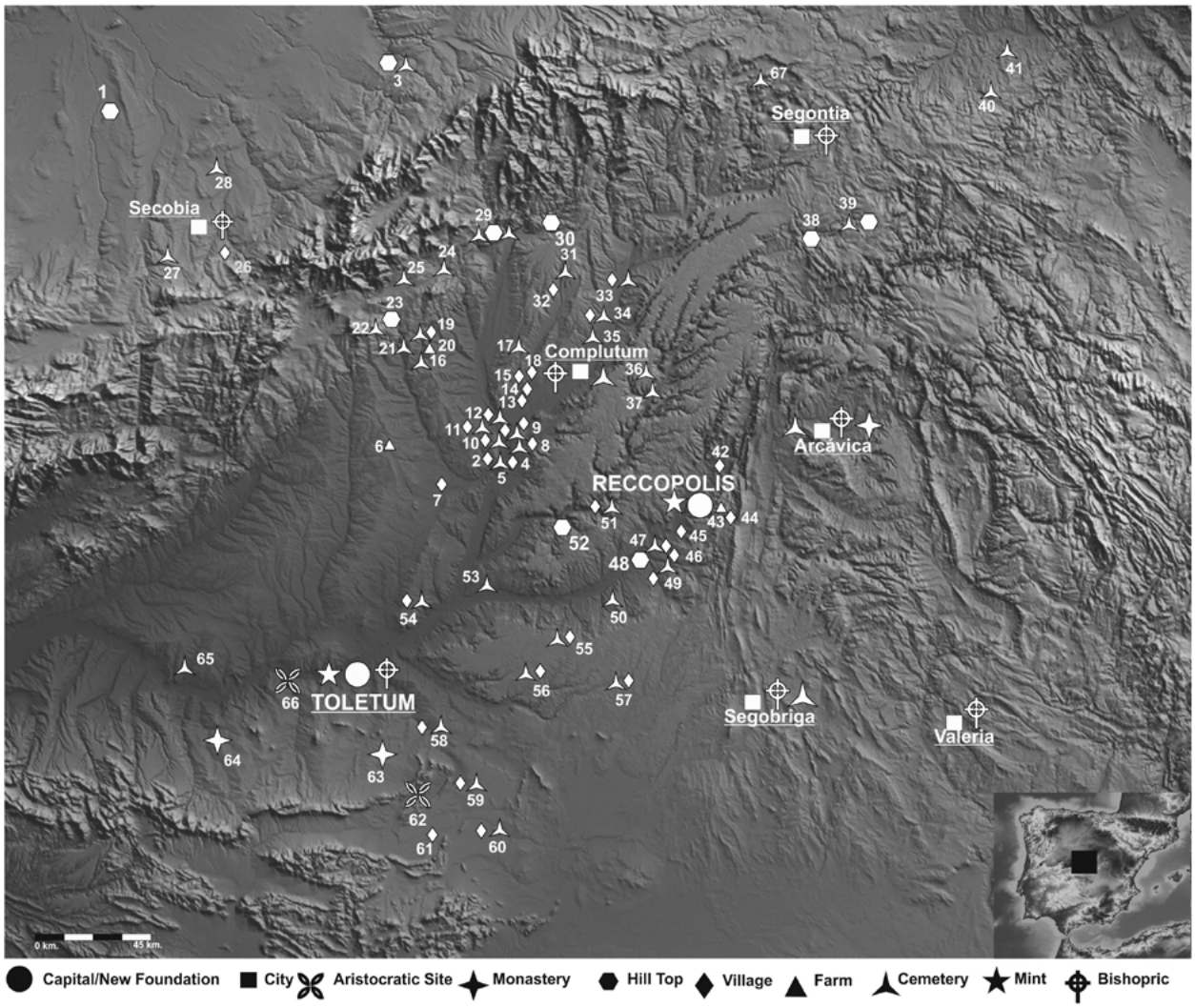
It has been pointed out that the collapse of the Late Roman system in the 5th century AD was a determinant event for the Mediterranean and European West, which then entered a process of intense social change. In the Iberian Peninsula, 6th century AD landscapes were presided by heterogeneity (Olmo-Enciso 1992: 187, 195-6). Change had begun in the second half of the 5th century AD, and entailed a full transformation of the social models and also of their projection onto the landscape. Change was, therefore, deep and wide-ranging: for example, the crisis of the Roman *civitas* and the subsequent changes undergone by urban centers (Diarte-Blasco 2015: 293-296, 298, 307), the abandonment of *villae* and the emergence of new kinds of rural settlement, the adoption of new agricultural strategies, and the social response to the Early Medieval Cold Episode (AD 450-950). These changes resulted in a completely new urban and rural configuration of the landscape, a new framework which was consolidated in the second half of the 6th century AD (Olmo-Enciso 2008a: 41-2; 2010: 87; 2015: 15, 18-9, 41-2; 2018a:193).

It is, therefore, crucial to understand that the new Iberian landscape, which was consolidated by the 6th-7th century AD, is a direct reflection of the development of the new Early Medieval society: the changes that occurred here were part of broader changes that took place at that time in the Mediterranean and in Western Europe. One determinant change was the emergence of a new productive strategy and settlement pattern which replaced the *villae*-based system that predominated during the Roman period. Most of the territory of the Peninsula came to be structured around settlements of different sizes, ascending from the smallest farmhouses to intermediate power-centers (hilltop settlements) and, from the 7th century AD on, churches, monasteries and a few aristocratic dwellings. An analysis of the rural areas based on the evidence provided by rural hamlets has shed some light on a historical subject, the peasantry, which had previously been virtually invisible (Vigil-Escalera 2007: 239-284; Quirós Castillo 2009; Roig Buxó 2009: 207-251). Some of these works have advocated the idea of a 'hamlet model', based on the control of production by the peasants themselves, which is a radical departure from the previous model and a highly significant development for the configuration of both the landscape and the social structure (Vigil-Escalera and Quirós Castillo 2013: 369-370, 376-7, 384, 386, 388). However, the archaeological record is also clear concerning the importance of the elites for the countryside, and we must, therefore, conclude that the social reality and the landscape were rather more complex than the 'hamlet model' suggests (Azkárate Garai-Olaún and García Camino 2012: 338-341; Roig Buxó 2013: 145-170; Sánchez Pardo 2014, 983-1023; Olmo-Enciso 2015: 15-42; 2018 a: 199). Several settlements in the Basque Country (Azkárate Garai-Olaún and García Camino 2012: 331-342, 348), the central regions (Olmo-Enciso 2015: 24-6) and Catalonia (Roig Buxó 2009) bear material witness to social hierarchies and the presence of elites. Similarly, from the 6th century AD on, it is clear that several settlements in the north and center of the Iberian Peninsula were engaged with mining activities in relation to the elites, including the centralized management, exploitation and distribution of mineral resources (Martínez Cortizas *et al.* 1997: 14-5; Sánchez Pardo 2014: 999-1000; Azkárate Garai-Olaún and García Camino 2012: 341; Colmenarejo García *et al.* 2014, 221-2, 225-6; Olmo-Enciso 2015: 23; 2018a: 199). From the 5th century AD onwards, on the other hand, a new type of hilltop fortified settlement is attested, indicating the presence of the elites in rural areas. These settlements have been interpreted as political and fiscal centers, articulating production and serving as spaces for negotiation between local elites, the Visigothic state and, in some cases, the episcopal sees (Perich i Roca 2014: 192-3; Martín-Viso 2014a: 248-252; Chavarría Arnau 2013: 156-8; Sánchez Pardo 2012: 29-56; 2014: 1006; Burch 2006: 36-8, 42-52: Olmo-Enciso 2018a: 199-200). The cities, for their part, largely underwent complex processes of urban disaggregation and the disappearance of the former notion of *civitas*. At any rate, cities kept some of their status during the Visigothic period and, for the most

part, still exercised their role as central places of their respective territories, while some were, in addition, promoted to become episcopal sees. Moreover, in the late 6th and early 7th centuries AD, the State and the Church undertook the urban development of a limited number of cities. This new dynamism affected only a limited, but significant number of episcopal sees. More importantly, these programs indicate the Visigothic State's desire to promote urban growth, as most clearly manifested by the foundation, *ex novo*, of Recópolis, and the renewal of the capital Toledo (Olmo-Enciso 1998: 109-118; 2010: 89-106; 2015: 29-30; 2018a: 200-201; 2018b: 239-240). These cities were economic and fiscal centers, all of them were equipped with mints (Olmo-Enciso 2006: 252, 260-2; 2008a: 59-60; Castro Priego 2010; 2014: 472), and their urban activity was closely connected with their character as recipients and consumers of agricultural surplus (Olmo-Enciso 2018a: 203-204). Cities operated as centers of production, consumption and redistribution; in addition, they were the points around which the rural landscape was organized – a reflection of a hierarchical society – as shown most clearly in Catalonia and the center of the Peninsula (Roig Buxó 2009: 213; 2013: 152; Olmo-Enciso 2015: 33-35, 40-41).

Over the course of the last decade advances have been made in the reconstruction of the Early Medieval environments in the Iberian Peninsula. The evidence is still scarce and unevenly distributed, but some synthetic proposals and diachronic inferences may be put forward. This research chiefly involves two types of evidence: natural sedimentary deposits dated by calibrated radiocarbon methods, and cultural deposits from archaeological contexts. These two kinds of record demonstrate the simultaneous transformation of cultural and natural phenomena. The evidence, therefore, reveals the complex interplay of multiple factors, including climatic change, transformations in the structure of the plant population and innovations in the organization of the agroecosystem. The evidence offered by the palaeoenvironmental record all over the Iberian Peninsula suggests that these changes were intense, for instance the scale of forest clearing – mostly by fire – the formation of pastureland, the breaking-up of new land and the preparation of new territories for farming, as well as the expansion of extensive stock-breeding (Riera-Mora 2006: 19-26; 2008: 29, 30-5 and 37; Kaal 2011: 172-3; López-Sáez. 2014: 113, 117; Varón-Hernández 2012: 300-1; Hernández-Beloqui 2015: 83-4). At the same time, some evidence indicates the adoption in some areas of Iberia of new agricultural formats. This adoption resulted in the formation of an agricultural landscape that was in clear contrast to its Roman predecessor, especially in terms of the construction of terraces, which seems to have been particularly widespread in Galicia, where the system was already consolidated by the 6th century AD, and the Basque Country in the 6th and 7th centuries AD (Ballesteros-Arias 2010: 37-8; Ballesteros-Arias 2006: 214; Varón-Hernández 2012: 301). The palaeoenvironmental record also provides evidence of intense mining activity, especially concerning the small-scale extraction of metals in the north-west of the Iberian Peninsula (Martínez Cortizas 1997: 14-5; Sánchez Pardo 2014: 999-1000). To a large extent, these changes seem to be a response to the climatic crisis that took place around this time, known as the Early Medieval Cold Episode (450-950). As we shall see presently, this episode brought deep climatic disturbances to the Mediterranean and the European West (McCormick 2012; Delogu 2012).

This new landscape is, therefore, framed within the broader processes of social transformation that were taking place in the Mediterranean and Western Europe at this time. In the specific case of Iberia, there were significant regional differences concerning the intensity and speed of the process. The northern regions were more closely connected with the processes that were changing the face of the north and the west of the European continent, whereas the rest of the Peninsula evolved in the wake of Mediterranean developments (Olmo-Enciso 1992: 187). Archaeological research carried out in recent decades has revealed that in the Iberian Peninsula settlement patterns were more complex than in Central and Northern Europe (Olmo-Enciso 2015: 16). In Italy, also, from the 5th century on the landscape was characterized by a high degree of regional variation (Francovich and Hodges 2003: 26; Wickham 2005: 508). The variability that characterizes the Mediterranean landscapes, especially compared with Central and Northern European regions, has been singled out as one of the key characteristics of the region (Wickham 2005: 508; Gelichi 2010: 83) and is a crucial factor in the interpretation of Early Medieval society in the Iberian Peninsula. For this reason, progress relies on holistic approaches that take into consideration all the archaeological evidence as well as the landscape within which this evidence is framed. The variability of Early Medieval archaeological horizons in the Iberian Peninsula was pointed out long ago (Olmo-Enciso 1992: 185-198), and has more recently been confirmed with new examples; this variability is interpreted as a reflection of the different intensity with which the new practices and models were adopted in each region (Olmo-Enciso 2015: 17-8). In order to adequately outline our research and avoid *a priori* assumptions based on a single, isolated social factor, it is necessary to determine the pace of change in each area. It is equally important to characterize each region environmentally. Owing to the topographical complexity of the Peninsula, up to four major bioclimatic regions may be distinguished. Among these, the areas characterized by a Mediterranean bioclimate were characterized by particularly



1. Bernardos 2. Tinto Juan de la Cruz 3. Duratón 4. Gózquez 5. La Indiana 6. La Vega 7. El Pelícano 8. El Jardinillo/Perales 9. Congosto 10. Acedinos 11. Fuente de la Mora 12. La Gavia 13. El Rasillo 14. La Huelga 15. Prado de los Galápagos 16. Fuente del Moro 17. Daganzo 18. Casas de la Baezuela 19. Navalahija 20. Navalvillar 21. Los Remedios 22. El Rebollar 23. Cancho del Confesionario 24. La Cabrera 25. Venturada 26. Cárcava de la Peladera 27. Madrona 28. Espirdo 29. El Berrueco 30. El Pontón de la Oliva 31. Cerro de las Losas 32. Talamanca 33. El Ruiseñor 34. Alovera 35. Azuqueca de Henares 36. Los Santos de la Humosa 37. Anchuelo 38. Gualda 39. Trillo 40. Corduente 41. Villel de Mesa 42. Sayatón 43. La Paeriza 44. Los Arroyuelos 45. Cabanillas 46. Haza Plana 47. Vega Alóciga 48. Cerro de la Muela 49. Algarga 50. Santa Cruz de la Zarza 51. Orusco 52. Carabaña 53. Cacera de las Ranas 54. Cabañas de la Sagra 55. Villarrubia de Santiago 56. Los Villares de Ocaña 57. Villatobas 58. Nambroca 59. Orgaz 60. Los Yébenes 61. Arisgotas 62. Los Hitos 63. San Pedro de la Mata 64. Melque 65. Carpio de Tajo 66. Hernán Páez 67. Palazuelos.

Figure 1. Early Medieval sites (6th-8th centuries) in the center of the Iberian Peninsula (Olmo-Enciso, 2015: 16).

significant shifts in plant population (Currás 2012: 32; Julià 2001; Riera Mora 2006 17, Figure 1).

All of this is revealing of the need to approach the study of the landscape from a multi-scale perspective. Scale, in fact, becomes a crucial research factor: it outlines the questions that can be asked and 'activates both human environmental relations and our study of those relations' (Crumley and Maquardt 1990: 74-5, in Ashmore 2007: 263). We shall begin our analysis from a regional perspective, specifically the central region of Iberia, assuming the oft-quoted idea that a regional approach mediates between the local level and macro-level approaches (Smith 1976: 6). For this period and its different phases, the regional scale offers the best resolution for the analysis of social hierarchies and inequality (Paynter 1982; Olmo-Enciso 2015).

The center of the Iberian peninsula: the south of the Castilian plateau

Regional perspectives offer the best resolution for the analysis of the social dynamics of the period and their transformation, and such an analysis must be based on a combination of the archaeological evidence from both urban and rural contexts and the environmental evidence. In this regard, during the period under consideration, the south of the Castilian plateau, which essentially encompasses the basin of the Tagus River, presented a more complex landscape than was

hitherto believed. Archaeology is providing more and more evidence of the diachronic transformation of a landscape characterized by multiple peasant villages and hamlets, farms, intermediate power centers – hilltop settlements – ecclesiastical centers, aristocratic dwellings and cities of different sizes, especially Toledo and Recópolis, the two chief examples of State-sponsored urbanism. The palaeoenvironmental record indicates that the climate was drier, which had an effect on the agroecosystem and, therefore, the productive economy. An examination of all these features on a regional scale highlights several aspects which must be considered for the social relationships of the period to be fully understood. The landscape, from the second half of the 6th century onwards and throughout the 7th century, reflected the prevalent social stratification.

The landscape was largely organized around a large number of small villages (Figure 1) which from the second half of the 5th century onwards finally broke away from the previous Roman model (Vigil-Escalera Guirado 2007: 239-284; Quirós Castillo 2009; Vigil-Escalera Guirado and Quirós Castillo 2013: 369-370, 376-7, 384, 386, 388). The analysis of these hamlets, in addition, has made visible a historical subject that, despite its importance, had been virtually invisible in the archaeological record, the peasantry. These hamlets have been identified in large numbers, which suggests that the peasantry was the key group in the operation of the agroecosystem, both in demographic and economic terms. These hamlets have been the basis of a 'hamlet model' which, at the very least, has served to paint a more complex picture of the social framework, and also the associated landscape, within which the peasant population must be considered. To begin with, we have had to define the actual meaning of the notion of 'peasant population'. Wickham points out that the generic idea of the 'peasant population' was a simplification of a complex social reality – dependent peasants, small landowners, tenants, wage laborers and slaves – within which we must include a top order of wealthy peasants (Wickham 2005: 386). These gradations can also be detected in the archaeological record through hierarchy markers: for example, the use of different construction techniques in the houses, the size of the hamlets, the presence or absence of functionally distinct areas (e.g. habitation, production and consumption), and the presence of glass and North African imported ceramic wares. The latter were part of vertical exchange flows that linked these hamlets with the intermediate and urban centers in which the elite lived (Vigil-Escalera Guirado, Quirós Castillo 2013: 376-7, 384, 386). In fact, the identification of rural elites in the region is of crucial importance for the understanding of the social model. The presence of elites had been attested in the north of the Iberian Peninsula (Azkárate Garai-Olaún and García Camino 2012: 331-342, 348; Roig Buxó 2009: 222-3) but was somewhat overlooked in the region under examination. The presence of significant elements of material culture – swords, lances, shields, gold and silver jewelry, *paterae*, *bullae*, *tremisses* – in some hamlets, farms and necropolis (Morín de Pablos and Barroso Cabrera 2010; Penedo Cobo 2007: 584-9, 591-2; Fernández Godín and Pérez de Barradas 1931: 3-15) has been interpreted as signs of hierarchization and the presence of elites in the rural areas (Olmo-Enciso 2015: 25-6; 2018a: 199-200). The data collected in some of these hamlets indicate the importance of agricultural and stock-keeping activities. Around hamlets, woodlands generally gave way to pastureland and open forest, especially well-suited for herding. Cereal pollen is abundantly present in silos (17%-26%), and has also been found in significant quantities in natural deposits, which suggests that agricultural practices were oriented towards the production of cereal (López Sáez 2003: 28-36; 2004: 169-176). Carpological analyses carried out in the hamlet of Gózquez have demonstrated the presence of wheat, barley and oats (Vigil-Escalera Guirado 2013). Analyses of the site have also yielded evidence of the cultivation of olive trees and vines in the vicinity of the settlement (López-Sáez 2004: 170, 175). Concerning the fauna, the archaeozoological analysis in Gózquez and La Huelga (Figures 1: 4 and 14) has revealed the predominant presence of domestic species, chiefly goats and sheep (24%-48%), a smaller but still significant proportion of cattle remains (20%), the absence of pigs and the considerable presence of horse remains (15%). A recurrent archaeological problem is the absence of evidence for the organization of the productive landscape, its characteristics and the morphology of the agroecosystem, which not only involved these small peasant hamlets but the whole range of settlement levels. In Gózquez, several agricultural plots of land have been found, intersecting between residential areas, a distribution pattern which has also been observed in other sites in the region (Vigil-Escalera Guirado and Quirós Castillo 2013: 382). This intra-site distribution model is related to subsistence economic strategies. The problem is that other details concerning the organization of the agroecosystem – e.g. aspects of the systems and the internal organization – are still lacking, despite the information yielded by the palaeoenvironmental record. Owing to this paucity of information, the relationship between the hamlets and their agricultural hinterland remains unknown, as does the social characterization of peasant labor. Of considerable interest, especially concerning productive activities other than agriculture and herding, is the discovery of an iron-mining landscape that has been dated to between the 6th and 8th centuries AD. This landscape comprises two settlements – Navalahija and Navalvillar (Colmenar Viejo, Madrid) (Figures 1: 19 and 20) – which include areas and buildings for the extraction, processing and distribution of iron (Colmenarejo García 2014: 221-2, 225-6). These

settlements are situated at the foot of the Central System, in the midst of a landscape of open forest, caused chiefly by intensive herding and by activities related to iron extraction. The presence of abundant evidence for sheep-rearing and for iron, along with the absence of significant evidence for the practice of agriculture, indicates a different specialization for this geographical area (López Sáez 2015: 133-145). All the evidence suggests the centralized management, exploitation and allocation of surplus, which is once more the reflection of a hierarchical system controlled by local elites A similar system has been attested in the north of the Iberian Peninsula – Galicia and the Basque Country (Olmo-Enciso 2015: 23; Martínez Cortizas 1997: 14-5; Sánchez Pardo 2014: 999-1000; Azkárate Garai-Olaún and García Camino 2012: 341).

The evidence, therefore, no longer supports the idea that this peasant landscape could have operated independently from any form of social and economic direction by the elites (Vigil-Escalera Guirado and Quirós Castillo 2013: 369-370, 376-7, 384, 386, 388). It is true that, to date, the evidence that can be provided to support the idea of central direction is thin, but this paucity also applies to those arguments which support the idea of a peasant-ruled economy. It is worth pointing out that forms of domination based on the control of resources do not require large landowners to be physically present in the hamlets (Olmo-Enciso 2015: 22). Vigil-Escalera and Quirós Castillo, at any rate, accept the existence of differentiated urban and rural elites, and also of large land holdings in some regions of the Iberian Peninsula while still recognizing that aristocracies may be less archaeologically visible than could be expected (Vigil-Escalera Guirado and Quirós Castillo 2013: 388). In this regard, we may draw a line between two different levels of economic exploitation of the agroecosystem: a baseline subsistence level and one for the satisfaction of the surplus demands from above (Olmo-Enciso, 2015: 22-4). As we shall see presently, a contextualized analysis of the archaeological record reveals the presence of practices which can only be explained as part of an economic system based on the extraction of surplus by the elite.

The partial seizure of resources is a clear manifestation of elite and State control. This is true even if the level of wealth attained by the elites is relatively low (Wickham 2008: 10). A manifestation of the presence of these elites – and the element of control that they introduced – in the rural areas is the proliferation of hilltop settlements, which have been found all over the Iberian Peninsula, and are sometimes also referenced in the written sources using the ambiguous terms *castra* and *castella*. In Iberia, these terms encompass a wide variety of habitats, from small hilltop centers to larger settlements which could be several hectares in size. Some of these grew to become *civitates* (Chavarría Arnau 2013: 156-157). Those which have been found in the center of the Iberian Peninsula have been interpreted as nuclei of political activity with fiscal functions and, therefore, points of contact between the local elites and the central authorities (Castellanos and Martín-Viso 2005; Martín-Viso 2014a: 252). This is reflected in the archaeological record, which attests to the construction of defensive walls, the hierarchization of space, the possible presence of prestige buildings, and the fiscal inscriptions on slate slabs (Martín-Viso 2014b: 145-168). The most significant examples in the central basin of the Tagus River are Cancho del Confesionario (Manzanares el Real, Madrid) (Figure 1: 23), Cerro de la Cabeza (La Cabrera, Madrid) (Figure 1: 24), Carabaña (Madrid) (Fig.1: 52), Dehesa de la Oliva (Patones, Madrid) (Fig.1: 30), El Raso (Candeleda, Ávila) and Gualda (Guadalajara) (Figure 1: 38), (Caballero Zoreda and Megías Pérez 1977; Yañez 1994: 259-287; Rascón, 2000: 219; Vigil-Escalera Guirado, 2012: 251-2, 255, 258-260; Balmaseda Muncharaz, 2006: 240; Cuadrado Prieto, 2002: 501-8). These settlements are all far away from urban centers and must have had administrative, fiscal and economic control functions, as demonstrated by the slate inscriptions found in some of the hilltop settlements in the western region of the Central System (Martín-Viso 2014b: 145-168). A consideration of these settlements, which were the place of residence of the elites, as power centers, is crucial to understand the organization of rural landscapes around these intermediate centers. In turn, they were the physical manifestation of the ability of the elites to extract the surplus on which they based their dominant position (Olmo-Enciso 2015: 26-9).

The urban landscape in this region was the most complex and diversified of the whole of Iberia. Alongside the typical Early Medieval, disaggregated urban centers, we find the two chief examples of State-sponsored urbanism: Toledo and Recópolis. In general, however, urban landscapes were not very different from the poly-focal model which characterized this period in Western Europe (Hodges 2015). The urban landscape was, therefore, not that far removed from the rural landscape; buildings were similar to those found in the largest hilltop settlements and villages (Olmo-Enciso 1995: 217). From the 6th century onwards, most of the cities in the region, which were in nearly all cases episcopal sees, belong to this poly-focal category: Segóbriga, Complutum, Ercávica and Valeria (Abascal, Almagro-Gorbea and Cebrián 2008: 226) (Figure 1). At all events, however, these cities managed to retain their urban status during the Visigothic period, and were the foci around which the territory was organized. In fact, it was this central character, as well as their religious function – the first three had important religious buildings in their suburbs – which helped them to keep some degree of cohesion. It is, at any rate, worth mentioning that even these cities can be divided into

different categories: the organization of Segóbriga, for instance, was more complex and had a different type of religious construction (Cebrián 2017: 107-121). In any case, the urban landscape offered by these cities clearly differed from that of Toledo and Recópolis, and the presence of the elite was less obvious. This contrast and the lower visibility of aristocracies in the archaeological record must also be analyzed in the right context and with regard to the landscape as a whole; it is another instance of the multi-layered distribution, representation and organization of social and political power (Olmo-Enciso 2018a: 201).

The foundation *ex novo* of Recópolis and the urban expansion of the capital Toledo, between the second half of the 6th and the first half of the 7th centuries, are the most notable examples of State-sponsored urbanism. The new urban landscape is the reflection of a renewed urban ideal and ideology. In Toledo, this is particularly apparent in the area of Vega Baja, which in the second half of the 6th century grew to obliterate the remaining Late Roman structures. In the Visigothic period, in addition, the urban density of the *suburbio toletano* increased and the image of the city was recast by a hierarchized urban construction program that occupied 90 hectares (Olmo-Enciso 2010) and involved the palatine complex, the most important churches (with the exception of the Cathedral, located in the upper area of the former Roman center), residential areas and commercial and industrial buildings. The street layout, on the other hand, was rearranged to follow a regular pattern. Items used in commercial and industrial operations –weights, scales, imported African and Eastern ware, worked ivory objects, remains of glass production– that were found in the vicinity of the palace are reminiscent of the urban scheme of Recópolis and other Mediterranean cities (Olmo-Enciso 2010: 98-100). The foundation of Recópolis and the total renewal of Toledo is indicative of the fiscal muscle of the early Visigothic state. Both cities were economic centers and the epicenters of the tax system; they also minted money, like a handful of powerful episcopal sees *Hispania* (Olmo-Enciso 2006: 252, 260-2; 2008a: 59-60; 2015: 29-31; Castro Priego 2010; 2014: 472; 2016). The initial success of the Visigothic State and the subsequent strengthening of the monarchy are archaeologically attested by the first issues of gold *tremisses* by Liuvigild, in 576-580, the foundation of Recópolis and the urban growth of Toledo (Olmo-Enciso 2001: 380-1; 2010, 96; 2015: 34-5; Castro Priego 2014: 469-471; 2016). The volume of *tremisses* in circulation increased; the monopoly of the state over the circulation of coinage has also been demonstrated (Retamero 2000: 127; Castro Priego 2010; 2014: 472; 2016). These factors are important if we are to understand the initial success of the Visigothic state and its ability to exact tribute, which was the basis of the financial prowess and the impetus of the s urban projects promoted by the State in Toledo and Recópolis. Following this line of thought, the cities thus become the most important piece of material evidence for the strength of State structures. It has been pointed out elsewhere that the urban growth experienced by these cities, their position in the landscape as beacons of power and their role in the organization of the rural landscape, cannot be dissociated from their character as centers for the reception of surplus (Olmo-Enciso 2015: 39-41; 2018a: 201).

In the mid 7th century, these dynamic cities entered a period of decline. The urban structures became increasingly disaggregated, and urban initiatives ceased. This is mentioned in the written sources, but the clearest evidence of the end of the constructive drive of the state and the Church in the cities lies in the archaeological record (Olmo-Enciso 1998; 2006: 261-2; 2007: 194-6; 2008a: 58-60; 2010: 106-7). This decline has been related to the crisis of the Visigothic State from the second half of the 7th century. The monetary system, for one, took a deep plunge and the gold content of *tremisses* fell from 80% to 30% in the early 8th century (Retamero 2000: 101; Castro Priego 2008: 139, 140; 2010; 2016). This shook an already weak tax system, and accelerated the already ongoing process of feudalization; the elites directed increasing resources to rural investments (Olmo-Enciso 1998: 116; 2007: 193; 2015: 36-8).In this period, the settlement patterns became especially diverse, fundamentally owing to the emergence of new power centers, largely churches and monasteries (Chavarría Arnau 2007: 224, 227-8), as well as important aristocratic residences. This suggests increasing control of the rural areas by the elites. The involvement of the Church was a decisive event in this regard. Christianization was an instrument for the disciplining of the peasantry and its integration in the elite-dominated ideological system (Olmo-Enciso 2015: 38; 2018a: 203).

These dynamics are reflected in the physical landscape. The central regions were affected by the same environmental processes as the rest of the Peninsula, but several micro-regional patterns, caused by geographical features such as mountainous systems and river basins, can be attested. The natural sedimentary deposits, which have been calibrated radiocarbondated, bear witness to a process of organized changes in the agroecosystem. Deforestation, by fire, accelerated during the 6th and 7th centuries, suggesting growing human pressure and the need to develop new pasturelands and open forest, which became the dominant features of the landscape (Riera-Mora 2006: 19-26; 2008: 22, 29-35, 37; Blanco González 2015: 2-6). In the mountains of the Central System, deforestation – which chiefly affected high-altitude pine forests – was particularly intense in the eastern (Pela and Ayllón range) and western (Gredos range) sectors, and somewhat less in the central sector (range of Guadarrama) (Gil García 1993: 49–57; Currás

2012: 49; Blanco González 2015: 6; Franco Múgica 2001: 113-124). At medium altitudes (900-1100 m.a.s.l), human action is attested by the reduction of deciduous oak. Deforestation was also intense in the valleys and plains, which came to be dominated by open forest habitats (Riera Mora 2006: 21). All of these phenomena had been under way since the 5th century but gained pace in the 6th and 7th centuries. Essentially, the forests were cleared by fire in order to impose slash-and-burn exploitation systems and to create spaces for new economic strategies based on intensive herding, farming and the breaking up of new fields. In particular, the intensification of herding and agricultural practices was very significant at the foot of the mountains (Riera Mora 2008: 22, 30), as demonstrated by the evidence collected in the mining sector analyzed to the north of Madrid province. The expansion of cultural habitats permitted the breaking up of new fields for sowing fodder plants and cereal – the introduction of rye, *Secale cereal*, has been detected, and this was adapted to thrive in low temperatures – and for introducing new species such as *Olea europaea* and *Castana sativa* (Blanco González 2015: 6). Evidence for this landscape has also been found in the palaeoenvironmental record of cultural deposits in the rich alluvial valleys in the basin of the Tagus River, both in rural and urban contexts, as we shall presently illustrate using the example of Recópolis. These sites were located in a landscape that, in the 6th-8th century, was dominated by open forests and pastureland; economic activity was oriented towards agriculture and also herding. The predominantly arid climatic conditions played a crucial role in the consolidation of this economic system. The intensity of the transformations undergone by the landscape suggests that they were to a large extent an organized anthropic reaction to the increasingly dry conditions. The large territorial scale of these changes suggests that, in this endeavor, the peasant groups were being directed by the political elite. It is worth stressing that, in this period, the regional authorities were forced to adapt the judicial calendar to the cereal harvest which, in turn, had to be timed earlier in the year than had previously been the custom, in order to avoid the recurrent swarms of locusts (*Lex Visigothorum II, 1, 12*; Barceló 1978: 70).

Recópolis: the construction of a landscape in the Visigothic period/early middle ages

The results of research on a regional scale from the center of the Iberian Peninsula suggest that there was considerable variation in the landscape and that this sort of evidence is relevant to the construction of the historical discourse. The variations not only concern the natural landscape, but also the levels of anthropic action upon the natural environment. However, a local perspective, for example, our investigation in Recópolis, makes it possible to analyze these relationship in much more detail.

The *ex-novo* foundation of a city is always a significant political act, but the foundation of Recópolis (Figure 2) also involved the total restructuring of the landscape. Archaeological research has demonstrated that the establishment of the city did not just involve founding the city, but also transforming the territory with a new road network, the foundation of new rural settlements and the reorganisation of the agroecosystem (Figure 4). Such an operation could only have been undertaken by the state. The written record clearly reflects the role played by the foundation of the city, in AD 578, in the discourse on the consolidation of the state and the creation of a tax system (Olmo-Enciso 2007: 181, 190, 192-4; 2008a: 45-6, 55-60; 2010: 100-2, 106-7; 2015: 34-7, 39-41). As previously noted, the foundation of the city is in itself a clear testimony of the Visigothic State's capacity to exact tribute until the mid-7th century AD. For two and a half centuries – between the late 6th and the mid-9th centuries AD, a period encompassing the Visigothic and Early Islamic periods – Recópolis was a dynamic urban centre.[2] The topography allowed for precise urban planning, which divided the different areas of the city hierarchically. The most important sector was the palatial area, situated on the highest ground (Figure 3). This sector, 1.4 hectares in size, could be seen from everywhere in the city and the surrounding territory. To date, excavations have revealed three major buildings (the largest is 140 m long), including a church, situated around a large open square. Both civil buildings were two-storeyed. The second floor was the most important: it was paved with *opus signinum* and decorated with architectural ornaments, whereas the ground floor was paved with lime mortar (Olmo-Enciso 2008a: 47-51; Olmo-Enciso *et al*. 2017: 80-86). They must have played a diversity of roles and uses (ceremonial, administrative, economic, storage, fiscal, etc.) (Olmo-Enciso 1987; 2015: 31; 2018a: 195, 197). Access to this palatial complex was achieved through a monumental gateway that opened onto the city's main thoroughfare. On both sides of this street there were two large buildings that were used by glassmakers, jewellers and merchants who were engaged in the distribution of consumer goods from the East Mediterranean (Gómez de la Torre-Verdejo 2012: 257-281; Bonifay and Bernal Casasola 2008: 99-115). The domestic buildings were divided into different rectangular spaces with different functions –dining rooms, kitchens– around a courtyard. Recópolis had two water-supply systems, respectively based on an aqueduct and a network of cisterns. This sort of mixed system has also been attested in other cities of this period (Olmo-Enciso 2008a: 54-5; Gurt and

[2] The archaeological excavations in Recópolis are funded by the Consejería de Educación, Cultura y Deportes, Gobierno Regional de la Comunidad Autónoma de Castilla-La Mancha.

Figure 2. Aerial view of Recopolis.

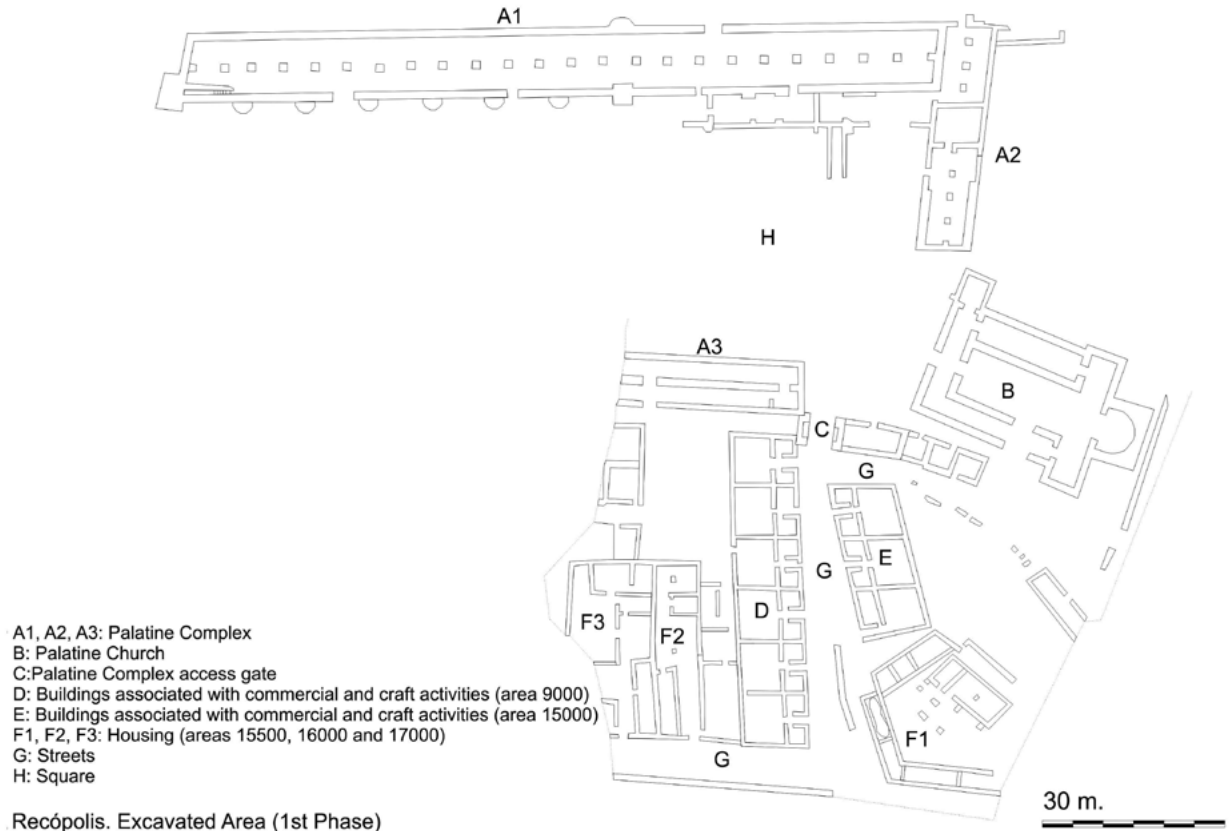


Figure 3. Recópolis. Excavated area (1st Phase).

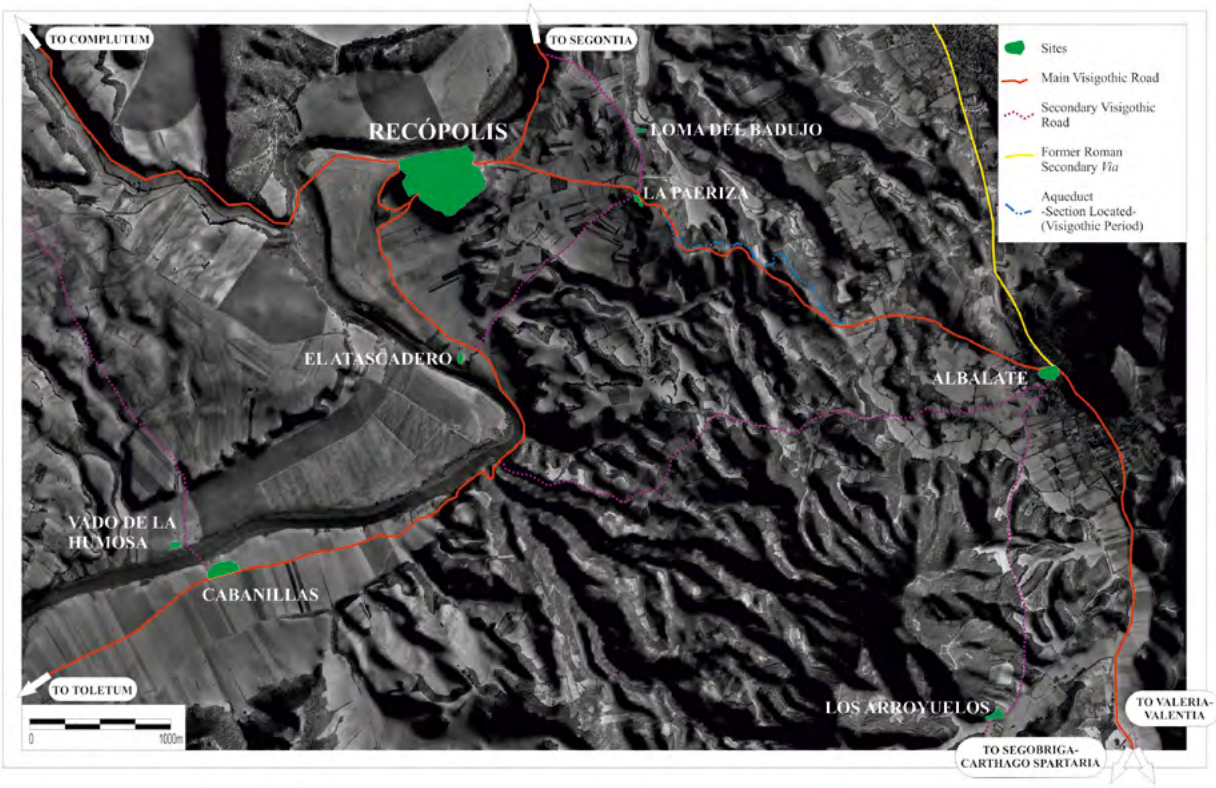


Figure 4. Recópolis. Reorganisation of the territory: new road and settlement network.

Sánchez Ramos 2008: 187-8). The city was encircled by a wall, furnished with towers; the gateways, which were made to coincide with the natural access routes, were made of masonry blocks and lined with lime mortar (Gómez de la Torre-Verdejo 2008: 77-86) (Olmo-Enciso 2018a: 195-197).

Recópolis was also a production and consumption centre, as indicated by the aforementioned workshops. One of the two glass workshops identified was in operation until the mid 7th century, while the other remained active throughout the 8th century and the early years of Islamic presence (Gómez de la Torre-Verdejo 2012: 257-281). The existence of a goldsmith and the excavation of his workshop led to the discovery of all kinds of jeweller's tools–bivalve casts, scale dishes, scoria– confirming the artisanal use of these buildings (Olmo-Enciso 2008a: 53; 2018a: 195). Also, the arrival of foreign merchandise for the city's elite is confirmed by the presence of ARSW D wares and North African amphorae and *spathia*. To date, the city has yielded the most important assemblage of Mediterranean consumer goods in the interior of the Iberian Peninsula (Olmo-Enciso 2015: 33; 2018a: 195). The ceramic productions of Recópolis, mostly thrown wares, present a morphological and functional variability which is typical of the centre of Iberia, including table wares and kitchen wares. The petrology of the fabrics demonstrates that most of these wares were locally manufactured (Checa-Herráiz, in press).

The foundation and construction of Recópolis and its city wall, palaces, etc. were a way to domesticate the social territory by making a clear show of power and control over resources. Urban planning implies the disciplining not only of the urban centre, but also of the surrounding territory and its population, which were thus introduced to the power of the elite. The landscape was, therefore, used to showcase a political ideology by means of a constructed statement. In addition to imposing the ideology of the elites, this sort of initiative generally also reinforced the internal cohesion of these elites (Paynter, McGuire, 199, 10). It is, therefore, not a coincidence that the city was simultaneously a political, administrative and fiscal centre. The fiscal function was represented by a mint and storage facilities related to the management of productive surplus. The city continued playing these functions, with varying degrees of intensity according to the period, throughout the Visigothic period and the first century of the Islamic presence (Olmo-Enciso 2018a: 197; 2018b: 245-247).

In addition, the foundation of Recópolis also involved the reorganization of the territory, with the creation of a new road and settlement network (Figure 4), around which the agricultural exploitation of the land, which was also reorganized, revolved. The organization of the territory around the city followed the same radial pattern that is so characteristic of other regions in the Early Middle Ages: the road network follows a clear

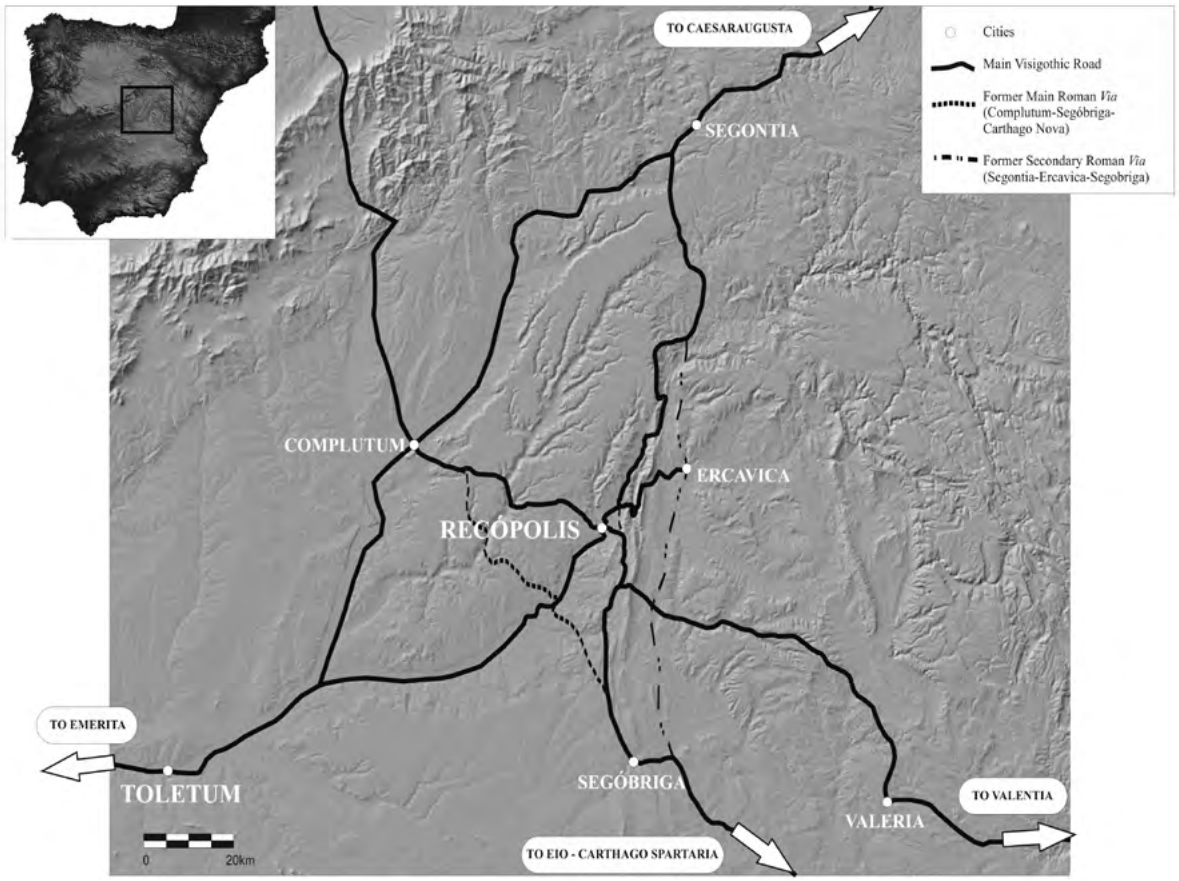


Figure 5. Road system in relation to Recópolis.

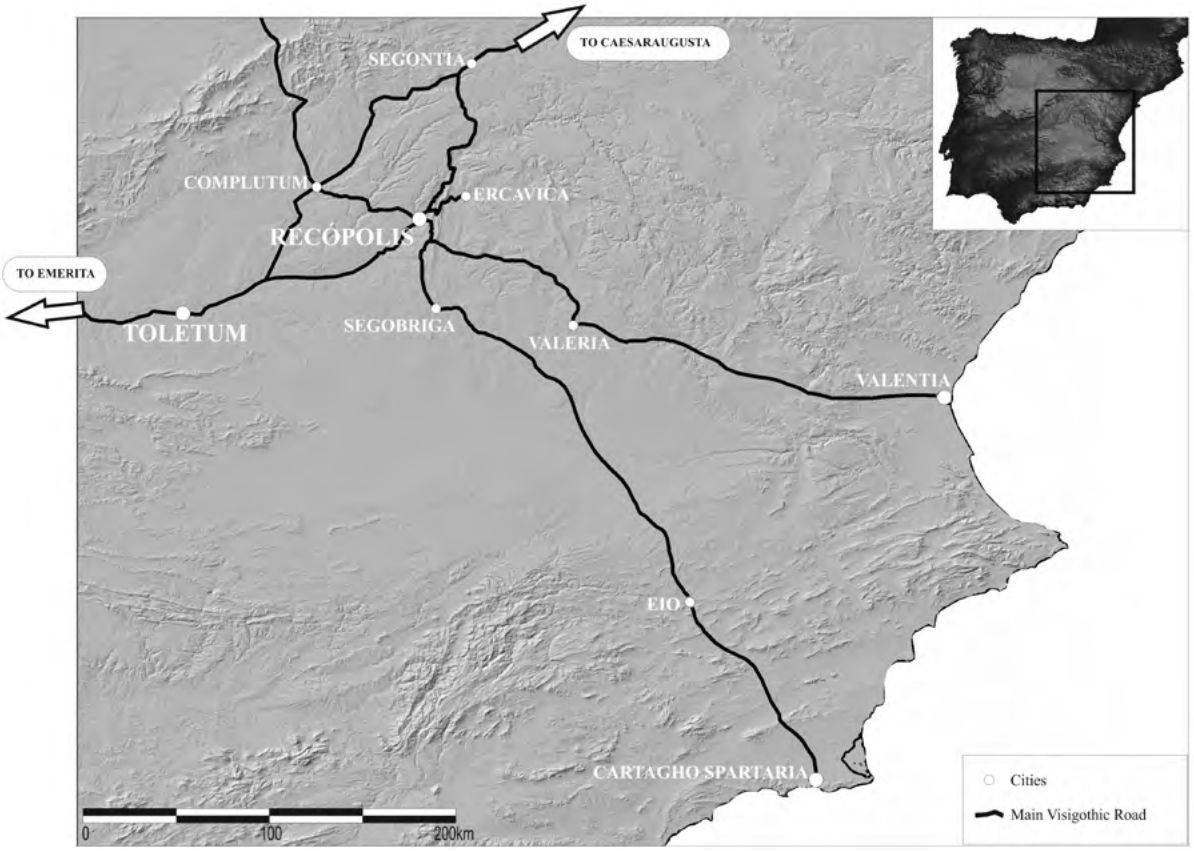


Figure 6. Road system between Recópolis and the Mediterranean Coast.

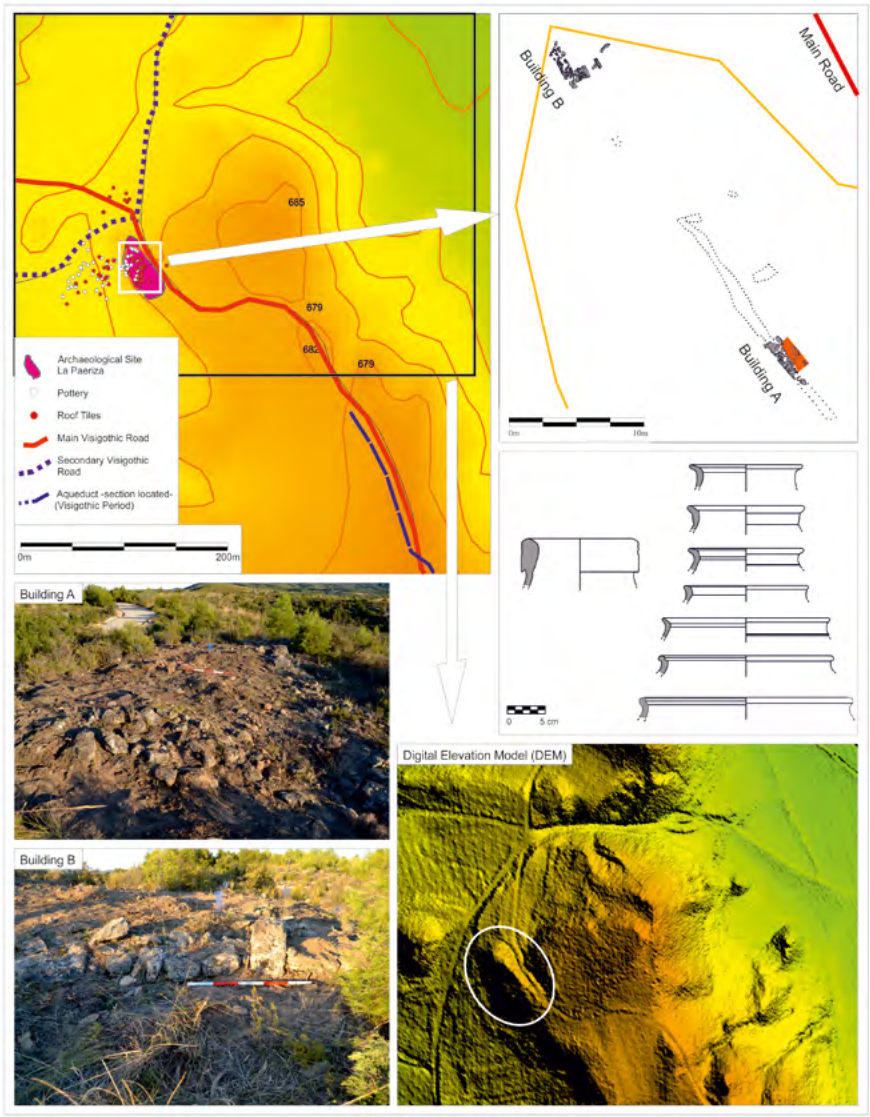


Figure 7. La Paeriza.

star-shaped plan. The analysis of this plan has yielded valuable information concerning the organization of the new agroecosystem and the distribution of agricultural properties. One of the most interesting discoveries of recent research campaigns has been the confirmation of the relationship between the time of the foundation of the city in the 6th century AD and the consolidation of the road network, which turned Recópolis into a central communication hub between the centre of the Iberian Peninsula and the eastern coast (Figures 5 and 6) (Olmo-Enciso 2018a: 197).

The archaeological evidence collected in the city itself must be interpreted in combination with that collected from the surrounding territory.[3] The research carried out on the wider landscape also suggests the emergence of a new rural landscape – including the aforementioned road network and new rural settlements – which follows the same pattern detected elsewhere in the centre of the Iberian Peninsula and widely differs from the preceding Roman pattern (Figure 1). These new settlement patterns included different kinds of settlement, but hamlets and farmhouses were particularly abundant; they are situated at a maximum distance of 4 km from Recópolis, which indicates that they were directly dependent on it. This is also demonstrated by the overwhelming presence of thrown ceramic wares and, at the site of La Paeriza (Figure 7), of imported materials (Keay 61, north african amphora). There were two slightly larger villages, Loma del Badujo and Los Arroyuelos (Figure 8), which were founded after Recópolis and built in the vicinity of important communication routes (Olmo-Enciso, 2018a: 197; 2018b: 248).

The use of new remote sensing techniques (LIDAR, thermography), along with aerial photography, reveals

[3] This research has been carried out within the framework of projects '*Construcción y Dinámicas de un Paisaje Medieval (HAR2009 11627)*'and '*Construcción del Paisaje Medieval: Agrosistemas y Cambio Climático (HAR2013 44270-P)*' Plan Estatal de Investigación Científica y Técnica, Ministerio de Economía y Competitividad, Gobierno de España.

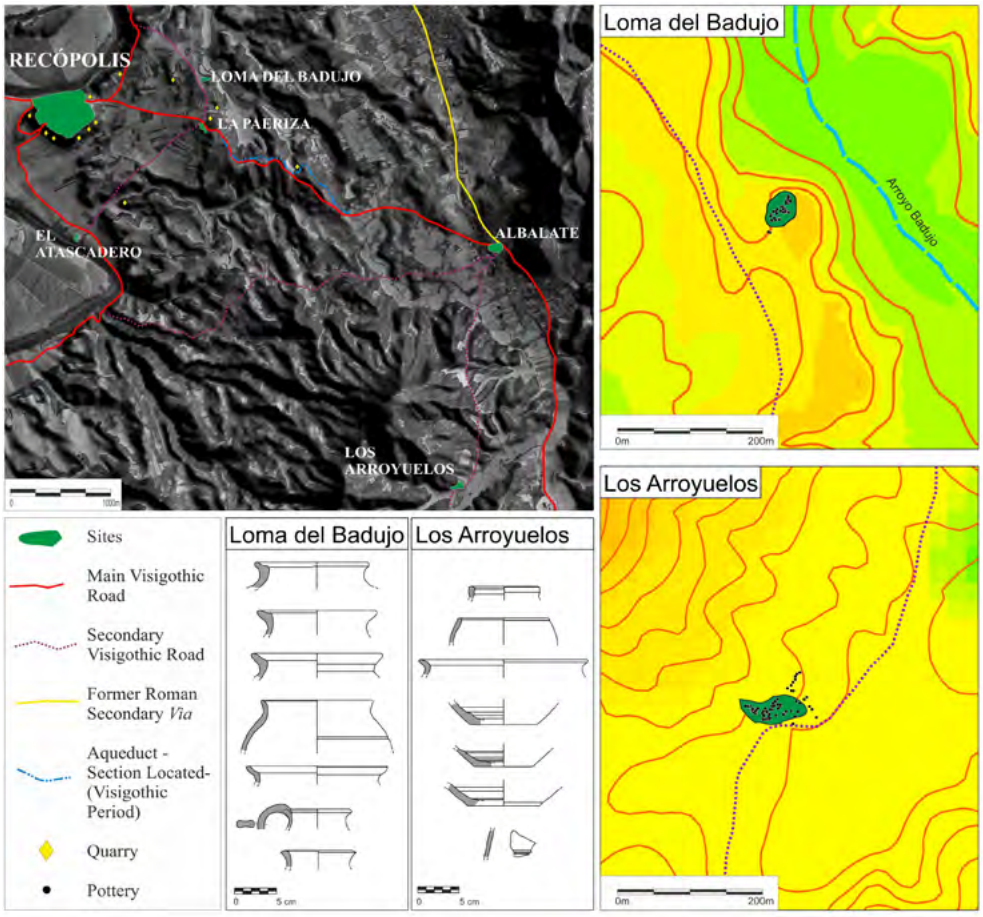


Figure 8. Loma del Badujo and Los Arroyuelos.

new evidence concerning the emergence of a new agroecosystem around Recópolis in the Early Middle Ages. These techniques were used to examine a high-density DTM (6 km²) with Recópolis at its centre. The use of LIDAR[4] technology has permitted the differentiation of various information levels and the design of a specific Surface Digital Model. This has been particularly useful in those areas where the micro-spatial information concerning the distribution of agricultural land plots is combined with terraced topography (Arroyo Badujo). In this sort of terrain, traditional aerial photography cannot draw an accurate picture of the structuration of space. In this regard, the micro-spatial survey carried out in the valley of Arroyo Badujo, in combination with the generation of a specific DTM-LIDAR for the area, has led to the precise identification of the course of an aqueduct. This structure was partially identified in the 1970s, but the new study has revealed its precise course for a distance of 1.89 km and the techniques used in its construction. It has also been discovered that the width of the structure was between 60 and 75 cm, and that the *specus* was crafted with hydraulic mortar. The only extant remains are situated near the High Medieval Settlement of La Paeriza (Figures 4 and 7).

Recópolis and the rural site La Paeriza have yielded valuable information for the reconstruction of the productive landscape and its palaeoclimatic characteristics during the 6th-8th century: for example, the information collected in the two soundings carried out inside (sequence REC-4 and samples REC-131 and REC-141) and outside the city (sequence REC-1, in the western gate), and in the rural settlement of La Paeriza (sample REC-134/5/6); (Figures 9 and 10). Overall, the evidence points to a predominantly open landscape: tree pollen does not reach 40% (PA<40%). Of the species of tree detected, the most representative taxa at regional level are *Pinus* and *Juniperus*, followed by local *Olea* and evergreen *Quercus*. Other taxa, such as *Corylus* and *Juglans* are represented to a lesser extent (below 3%); riverside species (*Alnus*, *Fraxinus* and *Ulmus*) amount to 7%. Bushes are little represented, the main taxa being *Ericaceae*, *Calluna*, *Cistaceae* and *Rosaceae*. Concerning herbs, *Asteraceae liguliflorae* and *tubuliflorae*, *Poaceae* and

[4] LIDAR data (acquired in 2009) were provided by the Consejería de Urbanismo y Ordenación Territorial, Junta de Comunidades de Castilla-La Mancha. They were processed in 2011. Processing involved the conversion of 'pointclouds' into raster, at 1400x1400 m. Resolution was 1 m/pixel. The processing was carried out with Terrascan and a specific algorithm aimed at concentrating the information in the first and last pulse measured in the LIDAR flight. This resulted in better quality and visibility of the LIDAR data, which were merged with the photographs collected by the Plan Nacional de Ortorrectificación Aérea (PNOA). Afterwards, a first classification of information was undertaken after designing a surface digital model (SDM), without vegetation and DTM in GeoTiff format. This processing was jointly carried out by the archaeology area in the Universidad de Alcalá and DIELMO S.L.

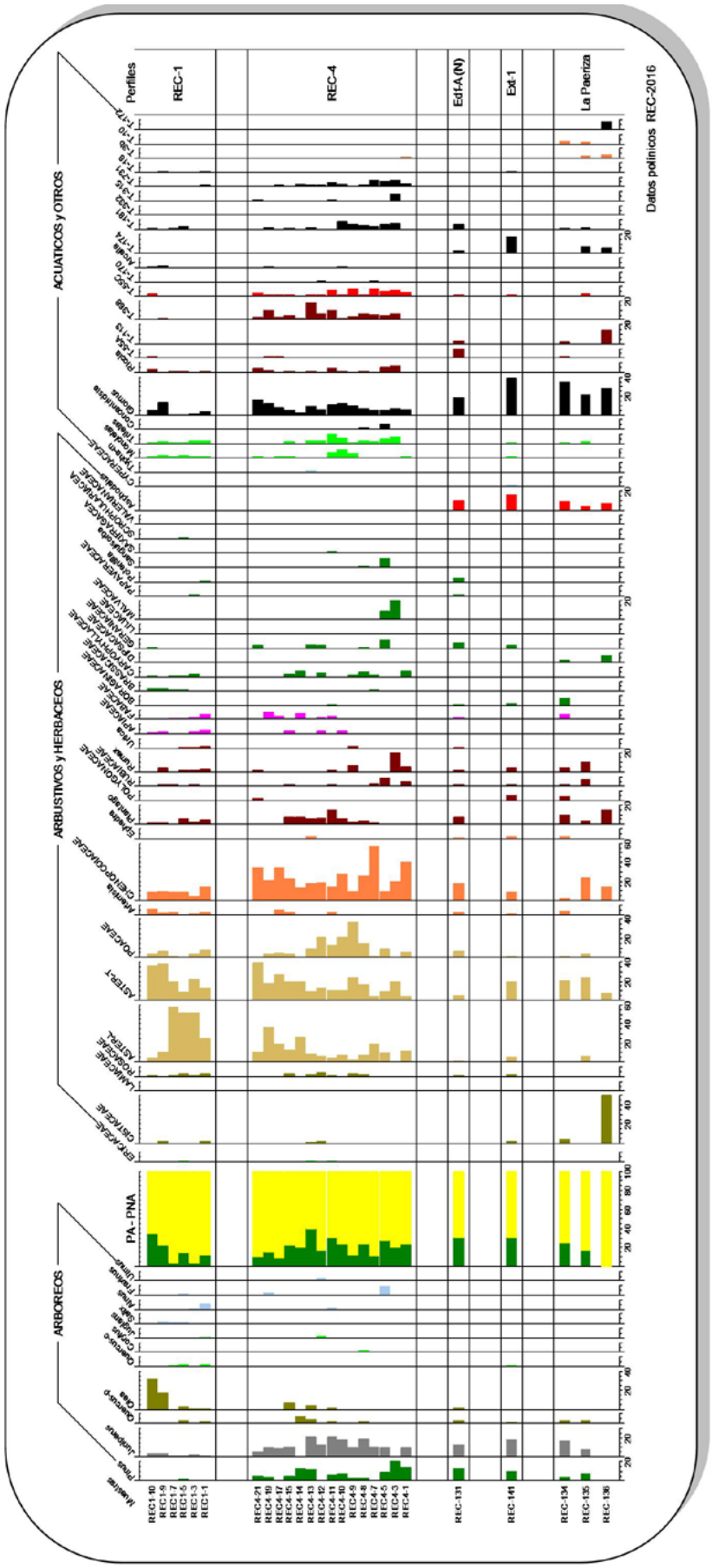


Figure 9. Pollen diagram from Recopolis and La Paeriza.

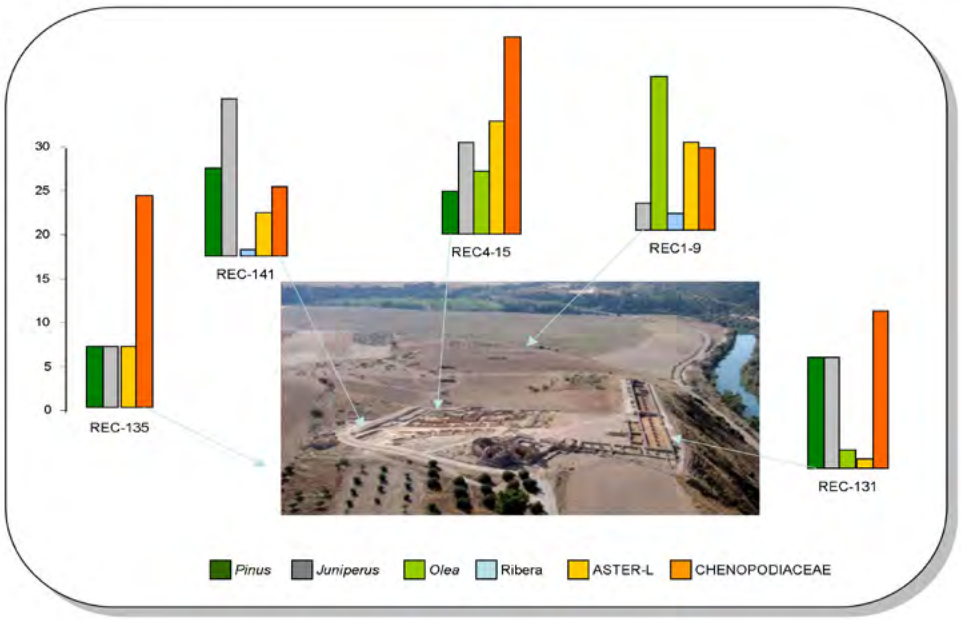


Figure 10. Percentages of vegetation.

Chenopodiaceae, are clearly predominant along with *Artemisia* and *Ephedra*, which belong to the group of steppe taxa. These herbal taxa form groups which are characteristic of pastureland (*Apiaceae, Brassicaceae, Caryophyllaceae, Fabaceae, Liliaceae, Poaceae* and *Scrophulariaceae*), as well as of ruderal plants (*Artemisia*, *Asteraceae liguliflorae y tubuli lorae Boraginaceae, Malvaceae* and *Papaveraceae*), the last three of which are also associated to agricultural land. If we add the presence of the non-pollinic microfossils (NPM) 3b (*Pleospora*), and the low presence of aquatic taxa (*Polygonaceae* and *Typha*), we can conclude that the plant population was a response to the arrival of Mediterranean dry climate and to heavy anthropic activity. This explains the development of the NPM 207 (*Glomus* cf. *fasciculatum*), which is related to deforestation processes and which is relatively high and constant throughout the sequence. The remaining NPMs appear in much lower proportions, and much more sporadically, but their presence can be useful in identifying some of the changes undergone by the environment, given their ecological and/or anthropic needs. For instance, there are indicators of herding in the form of coprophiles, (*Sordaria*sp or type 55A, *Podospora* sp or type 368 and *Riccia* cf. *sorocarpa*), and also of fire (*Neurospora* sp or type 55C), oligotrophic conditions (*Rivularia* or type 170), meso-eutrophic conditions (*Spyrogyra* and types 18, 181 y 731), dry conditions (*Pleospora* or type 3 b) and erosive processes (*Pseudoschizaea circula*).

In this climatic context, anthropic activity essentially involved herding, which explains the development of nitrophilic plants (*Plantago*, *Rumex*, *Urtica*, *Chenopodiaceae*, *Geraniaceae*, *Rubiaceae* and *Polygonaceae*), the presence and behaviour of NPM, be they oligotrophic (*Rivularia* or type 170), meso-eutrophic (*Spirogyra* and types 18, 181 and 731), orcoprophilic (*Sordaria* sp or type 55A, *Podospora* sp or type 368 and *Riccia* cf. *Sorocarpa* or type 165), and of indicators of herding and fire (type 55 C or *Neurospora* sp). In addition, taxa which are clearly related to the cultivation of cereal are absent In addition, the development of the *Apiaceae* and *Fabaceae* families, which can potentially be exploited for economic purposes, could also be indicative of agricultural practices. In this regard, the presence of *Olea* and, to a lesser extent, *Corylus* and *Juglans*, may suggest small-scale cultivation near Recópolis. The absence of cereal in the city is related to the difference in altitude between the settlement and the arable land, which is between 50 and 20 m, and to the particular characteristics of cereal pollen; this kind of pollen is often underrepresented in archaeological contexts unless found in *ex professo* storage facilities, such as silos, for example in the hamlets found in the central regions of the Iberian Peninsula. In fact, some genera of cereal, such as *Avena*, *Hordeum* and *Triticum*, are autogamous –that is, they self-pollinate– and as a result the airborne dissemination of pollen is minimal (Heim, 1970). Both factors –minimal dispersion and the production of small quantities of pollen– are reflected in the pollinic spectra found in archaeological sites, masking cereal cultivation activities from the record even when cereal production was carried out nearby. The absence of cereals in the pollinic spectra in Recópolis and La Paeriza, therefore, does not indicate that no cereal cultivation took place in the vicinity (López-Sáez, López García and Burjachs 2003, 24); the aforementioned difference in altitude also contributes to this result. Furthermore, the remaining evidence points to the cultivation of cereal in the area near Recópolis, for example the presence of ruderal plants, which are often associated with the presence of ploughed land.

Recópolis and the rural settlement of La Paeriza are on opposite sides of a valley (Figure 12); the area has an

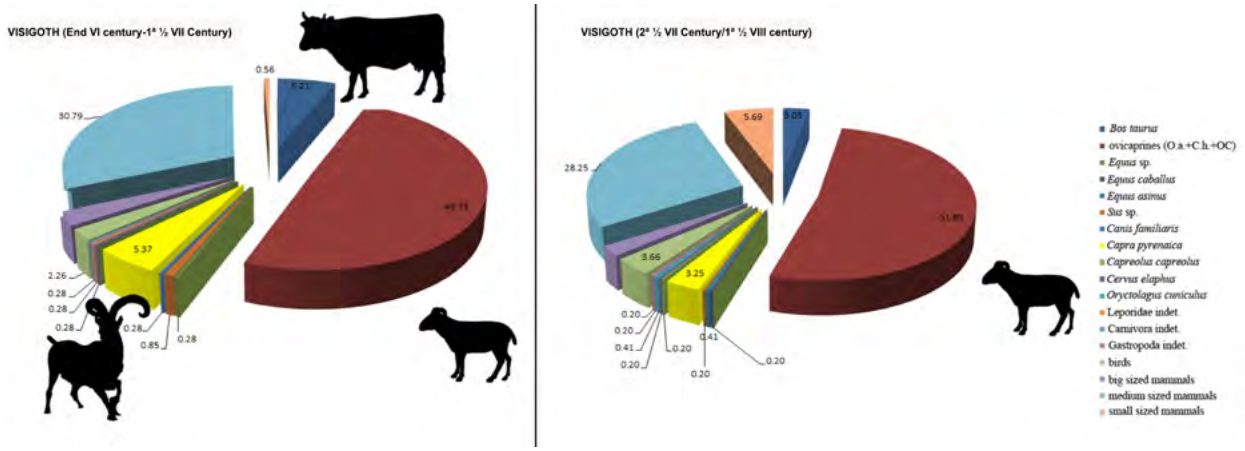


Figure 11. Zooarchaeological data from Recópolis.

average altitude of 630 m.a.s.l., whereas Recópolis is 650 m.a.s.l. and La Paeriza 680 m.a.s.l. The economy of the valley must have been based on agriculture and herding, as suggested by the distribution of plots of agricultural land and the pollen records. La Paeriza was surrounded by an open landscape, owing to intense, man-driven deforestation by fire in preparation for agricultural and herding practices. This is suggested by the presence of the NPM *Neurospora* (type 55C), which is indicative of forest fires, and the development of *Asphodelus* –a pyrophyte. Similarly, the presence of the NPM *Glomus* cf. *fasciculatum* (type 207) in Recópolis in relatively high and constant proportions also points to forest fires. These NPMs, therefore, indicate the intensity of the anthropic process aimed at opening spaces for their economic exploitation. This anthropic pressure focused to a large extent on creating good conditions for herding. The low amount of tree pollen, the development of nitrophilic taxa (*Plantago*, *Rumex, Chenopodiaceae*, *Rubiaceae*), which point to an increase of nitrates in the soil; the coprophilic *Sporormiella* (type 113) and *Neurospora* (type 55C); the significant drop of *Cistaceae* bush, which initially had appeared in significant numbers; and the ruderal plants (*Plantago*, *Rumex*), are also evidence of the strong level of human pressure.

The analysis of the structure and composition of the pollinic evidence points towards the development of dry, typically Mediterranean climatic conditions in a context of strong human pressure on the environment. The curve of tree pollen, the presence of NPMs *Glomus fasciculatum*, and *Neurospora* (type 55C) and the low level of bush pollen, are of particular interest, as they indicate the intensity of the transformations. The changes led to a completely new landscape in which agricultural and, especially, herding, were given priority; agricultural activity would have been focused on the production of cereal and some tree species such as olive, hazelnut and walnut.

Concerning fauna, the evidence from Recópolis is still limited, but can be combined with data from other contexts in the centre of the Iberian Peninsula. The analysis of the Early Medieval fauna demonstrates a predominance of sheep and domesticated goats, which concurs with the pollinic data that suggest the anthropic creation of an environment suited to herding. These species represent around 50% of the total number of samples between the 6th and 8th centuries AD, and 83% of all identifiable samples, including both wild (i.e. rabbits, hares) and domesticated species (Figure 11, Tables 1, 2 and 3). This percentage is much higher than in other nearby rural contexts, such as the hamlets of Gózquez (San Martín de la Vega, Madrid), with 48% (Vigil-Escalera Guirado 2013), La Huelga (Barajas, Madrid), with 30.5% (Morales Muñiz and Llorente Rodriguez 2004) and Las Dehesillas (Parla, Madrid), with 24% (Sainz de los Terreros 2008). The age of the specimens identified in Recópolis suggests a mixed exploitation regime (Helmer 2007). Initially, exploitation was more focused on secondary products, especially wool[5] (75% in stages G and H), and on B-type milk (12.5 % in stage E), than on A-type meat (12.5% in stage C). In the second Visigothic period, sheep and goats were largely exploited for B-type milk (71.43% in stage E) and to a lesser extent D-type meat (28.57%). Concerning the remaining animal remains, some conclusions can be drawn, although most regional studies are still in an initial stage of development, which makes it harder to draw useful comparisons.[6] One interesting issue is the scarce presence of *Bostaurus* and equines, which are common in rural settlements, such

[5] The systematic production of wool is well documented among the Saxons in the 8th and 9th centuries. However, some evidence suggests that the large-scale exploitation of wool could have begun much earlier, in the 6th century, for example at Bloodmoor Hill (Suffolk) (Crabtree 2010: 129) and Brandon (Suffolk) (7th century AD) (Crabtree and Campana 2015: 347). A similar process has been attested in Carolingian territories, although in this case the evidence points to a date in the 9th century.

[6] All animal data (Table 2) come from a very specific area of the site: area 17.000. Most of the deposits involved correspond to the formation of domestic spaces. This is, therefore, an ongoing task, although some of the results are already significant.

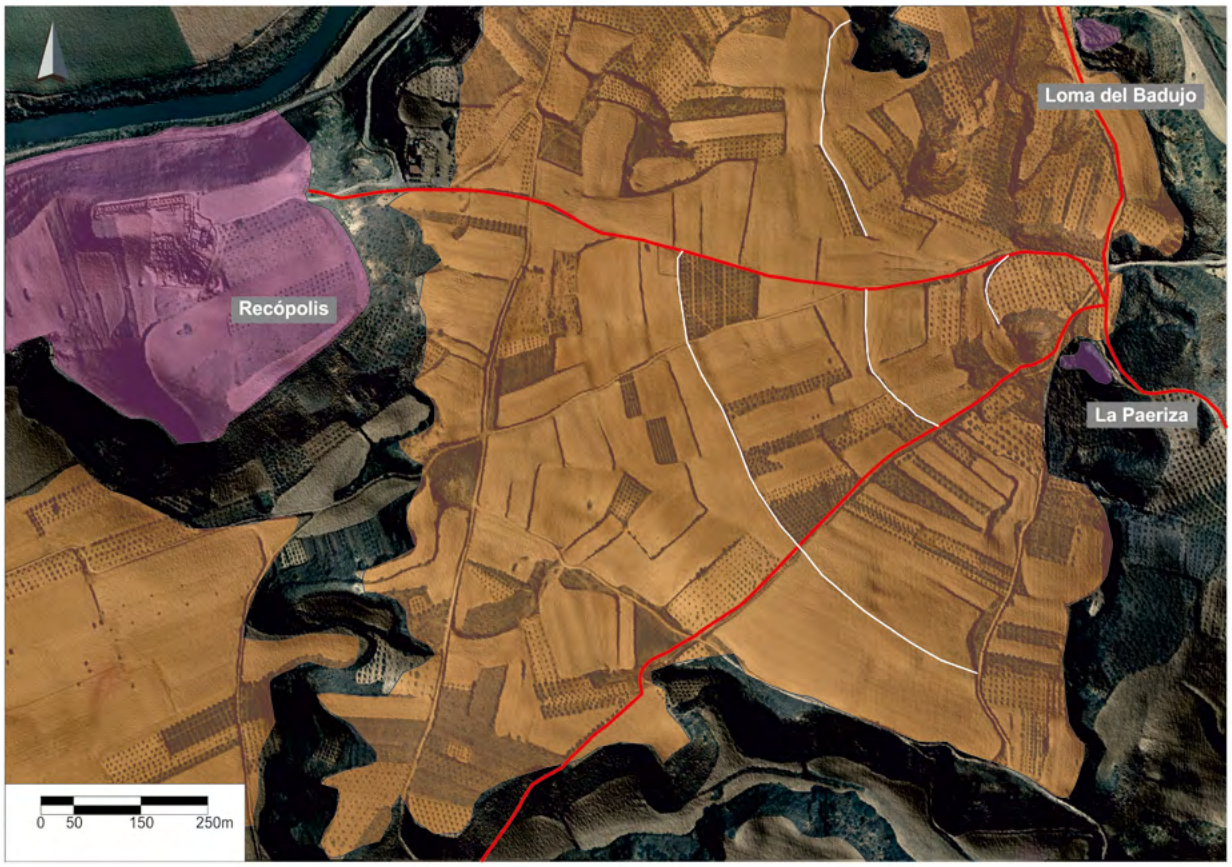


Figure 12. Early Medieval agrarian terraces proposed

as hamlets and farmhouses.[7] In contrast, wild fauna appear in Recópolis in small but significant numbers, in contrast to rural areas, where they are rare.[8] *Capra pyrenaica* is present in all stages between the 6th and the 9th centuries AD. During the 6th-7th century AD, it reached 5.37% of all identified samples. In the 7th and the early 8th centuries AD, their frequency decreased to 3.25%. Other wild animals appear in lesser numbers: for example, the roe deer (*Capreolus capreolus*) and the rain deer (*Cervus elaphus*), which are below 0.5% of the total. With such small percentages, it is very difficult to characterize the nature of hunting, as an economic or a social and prestige activity, as documented elsewhere in Europe in the 7th and 8th centuries AD (Sykes 2010: 179). Pigs and boars barely reach 2% of the total. It has not been possible to ascertain whether these correspond to domestic or wild specimens, owing to the highly fragmented state of the bones and the absence of diagnostic features. The limited presence of pigs in rural and urban sites dating to the 6th-7th century in the centre of the Iberian Peninsula (Morales Muñiz 1992; Grau Sologestoa 2009: 276),[9] makes it necessary to revise the thesis which suggests that, between the Visigothic and the Islamic periods, there was a considerable change in diet, and that in the Visigothic period most economic activity was oriented towards self-consumption.[10] At any rate, the evidence that points to the introduction of new elements in the Early Medieval diet is more complex than the mere absence-presence of a given species (Morales Muñiz 2011: 316-7).

It has been pointed out that the data collected on Recópolis and La Paeriza suggest a mixed economic use

[7] In Gózquez (Vigil Escalera-Guirado *et al.* 2013: 13), and la Huelga (Morales Muñiz and Llorente Rodríguez 2004, 5), equines amount to 15% of the total number of samples. Bovines represent approximately 20%. In contrast, in Recópolis, during the Visigothic period, the percentage of horses and bovine species hardly reaches 5% throughout the 7th-8th century AD, and under 11% in the 6th-7th century AD (the percentages are of the total number of domestic animals) (Table 1). The reason for these figures could be the urban nature of the site, and the area of the city where the evidence has been collected (the upper district), near the residential and industrial areas related to the palace.

[8] The presence of non-domestic species is not rare in the area under study. With an earlier chronology (4th-6th century AD) in the aristocratic settlement of La Torrecilla (Madrid) (Morales Muñiz *et al.* 2000: 186) and the Visigothic phases of La Huelga (Morales Muñiz and Llorente Rodríguez 2004: 5).

[9] Also for the north of the Iberian Peninsula, for example the sites of Esnaurreta and Arrubi, in the Aralar range (Navarre) (Castaños 2007). However, at other sites, also dating to the Early Middle Ages, for example Zornoztegi and Zaballa, pigs appear in third place behind bovine and ovine species (Grau Sologestoa 2009).

[10] Dealing with the Roman world, King pointed out that any attempt at generalisation had to take into consideration a considerable degree of regional variability (King 1999: 189-93).

VISIGOTH				
	1st Phase		2nd Phase	
	NISP	%NISP	NISP	%NISP
Eguus sp.	1	0.50	0	0
Equus caballus	0	0	1	0.37
Equus asinus	0	0	2	0.74
Bos taurus	22	10.89	15	5.51
Ovis aries	3	1.49	2	0.74
Capra hircus	5	2.48	0	0.00
Ovicaprines	168	83.17	251	92.28
Sus sp.	3	1.49	1	0.37
Total livestock	202	272		

Table 1. Number of Identified Species (NISP) and relative frequency of NISP of livestock assemblage.

Taxa	VISIGOTH (End 6th-1ª 1/2 7th century)	VISIGOTH (2ª 1/2 7th-1ª 1/2 8th century)
Bos taurus	6.21	3.05
Ovicaprines	49.72	51.83
Eguus sp.	0.28	0
Equus caballus	0	0.20
Equus asinus	0	0.41
Sus sp.	0.85	0.20
Canis familiaris	0.28	0
Capra pyrenaica	5.37	3.25
Capreolus capreolus	0	0.2
Cervus elaphus	0.28	0.2
Oryctolagus cuniculus	0	0.41
Leporidae indet.	0.28	0
Carnivora indet.	0.28	0.2
Gastropoda indet.	0	0.2
Birds	2.26	3.66
Big sized mammals	2.82	2.24
Medium sized mammals	30.79	28.25
Small sized mammals	0.56	5.69

Table 2. Relative frequency of determinable faunal remains from the Visigoth period of Recópolis.

VISIGOTH			
Age stages	Age stage	1st phase (NISP-8)	2nd phase (NISP-8)
A	0-2 month	0	0
B	2-6 months	0	0
C	6-12 months	12.5	0
D	1.2 years	0	28.57
E	2-3 years	12.5	71.43
F	3-4 years	0	0
G	4-6 years	37.5	0
H	6-8 years	37.5	0

Table 3. Relative frequency of NISP of combined ovicaprines from visigoth period of Recópolis site.

of the landscape, including agriculture and herding. Some morphological features detected in the valley between Recópolis and La Paeriza may be traces of Early Medieval parcellations.[11] The analysis of Early Medieval agricultural landscapes is a recent phenomenon; especially in France, new studies have begun to address the unbalance that exists between studies concerning agricultural landscapes dated to before and after the turn of the second millennium AD (Zadora Rio 1990; Chouquer 2007; Watteaux 2009). It has been argued that the originality of these landscapes was largely due to habitat dynamics (Watteaux 2009: 524-5). This has been attested for the 6th century AD with the emergence around cities and routes of communication of a new terraced agrarian landscape in the north-west of the Iberian Peninsula (Ballesteros-Arias, 2010, 22). In Recópolis and La Paeriza, the hypothesis for the creation of a new agricultural landscape is supported by the imprint of three curvy terraced lines that run between both sites (Figure 12) in an area where the shape of plots of agricultural land is predominantly rectangular. This leads us to the problem of the *longue durée* of the shape of plots of land: the curvy shape of agricultural land is often an inheritance from the Iron Age (Chouquer 2007: 22; Watteaux 2009: 109, 384, 523), but it is equally true that there is no evidence for an agricultural habitat between Recópolis and La Paeriza before the 6th century AD. The clear relationship that exists between these curvy morphological units and the new road network and settlement pattern created in relation to the city, including a junction in La Paeriza appears to support the idea that this agricultural landscape was another outcome of the rearrangement of the broader landscape, which was associated with the creation of the city in the late 6th century. A new city, new rural settlements, the reorganization of the road network, the construction of infrastructures such as the aqueduct, point toward the emergence of a new agroecosystem – already suggested by the palaeoenvironmental evidence – of which these morphological units would be part.

Pollen data from Recópolis is providing new, but still partial, information about the climatic conditions that prevailed in this area from the late 6th century AD, which seems to agree with the Early Medieval Cold Episode (AD 450-950). The climate fluctuations in this period, on a hemispheric level, in Central and Northern Europe, and also in some Mediterranean areas, have been subject to recent research (Büntgen 2011; McCormick 2012; Delogu 2012). This research has confirmed a lowering of temperatures in the mid 5th century. This lasted until the 6th century, which was

[11] We are waiting for the landlords' permission to carry out a stratigraphic study of the diachronic process that resulted in the formation of terraces, with a view to confirming or rejecting our hypothesis. I want to thank Ricardo González Villaescusa for his comments and suggestions with regard to this idea.

considerably colder. In the late 6th century, however, temperatures began to rise substantially, in a process of general warming that was to remain stable between the years AD 650 and AD 750 (McCormick 2012: 191, 200). This general trend was punctuated with colder cycles (Büntgen 2011: 580; McCormick 2012: 197, 199-200). These sequences have been reconstructed and integrated into the general natural and cultural framework (*ibid*, 174) using multiproxy data – tree-ring series, ice cores, fluctuations in solar radiation, speleothems, glacier movements, varve records, etc. – as well as the written and archaeological records. The data for the Iberian Peninsula is still scant and geographically uneven, but the data we do have coincide with those collected on a continental level (Olmo-Enciso 2018a: 198-199). In the specific case of Recópolis, the evidence suggests dry Mediterranean conditions and open, steppe-like landscapes, in line with the general character of the center of the Iberian Peninsula. This has also been attested in Tablas de Daimiel (Ciudad Real) (Gil García 2007), Castro de Peña Moñuz (Olmeda de Cobeta, Guadalajara) (Ruiz Zapata 2014), the lake of Taravilla (Taravilla, Guadalajara) (Moreno 2008: 2012), and the peat bog of Rascafría (Guadarrama Range, Madrid), (Ruiz Zapata 2008), among others (Olmo-Enciso 2018a: 198-199, 202). Also, the sedimentary deposits in some lakes demonstrate a sharp descent of the water line, which is evidence of a change in temperature. Similar trends have been detected in European and African lakes in the first half of the 6th century. The hemispheric cold episode has been related to volcanic eruptions (Büntgen 2011: 580). In the region under consideration, this has been detected in the Lake of Somolinos (Guadalajara) which, between the 6th and 8th centuries AD became a wetland (Currás 2012: 49); a similar process has been detected in other lakes, such as Zoñar (Aguilar de la Frontera, Córdoba) and, from the early 8th century onwards Montcortes (Baix Pallars, Lleida) (Martín Puertas 2008; Scussolini 2011, 383). The colder and drier period has been studied in the Iberian Peninsula using the δC^{13} data from the study of stalactites (Martín-Chivelet 2011). The data agree on the progressive installation of drier conditions, which is also reflected in the written record. This climatic cycle was also characterized by drought, bad harvests, famine, epidemics of *Yersinia pestis* and swarms of locusts – locusts were endemic and particularly active in the south central region-. These factors hit especially hard in the periods AD 540-5, 577-590, 630-641 and 694-709, critically so from the last quarter of the 6th century AD (*Chronica Caesaraugustana, a.a.542*; *Vitas Patrum Emeritensium, V, 2.3, 11.21, 14.2*; *Greg. Tur., Historia Francorum, VI.33, IX.22*; *Braulio, Epistolae., 3*; *Vita Sancti Audoini*, 7; *Lex Visigothorum II.1.12*; *Concilium Toletanum, XIV.3*; *Continuatio Hispana., 34; Ajbar Machmûa*). The written sources not only reflect the agrarian crises, but also describe conditions of extreme poverty and inequality among the peasants (Braulio, *Vita Sancti Aemiliani XX.27*) (Olmo-Enciso 2018a: 202-203; 2018b: 253-254). All of this seems to indicate that these events took a heavy toll on the agroecosystem and disorganized food production, a phenomenon which has also been attested in other regions (Büntgen 2011: 580). The challenge now is to try to interpret, on the basis of the natural and cultural data, what the human response to the climatic crisis was, at a time when the agricultural landscape was still being constructed.

Conclusions

Recent archaeological research in the southern regions of the Castilian plateau suggests that Early Medieval landscapes were more complex than previously believed. Archaeological evidence increasingly points to a landscape characterized by a dense network of peasant hamlets, intermediate power centers – hilltop settlements, ecclesiastical complexes and aristocratic dwellings – and cities of different sizes, including the two main examples of State-driven urbanism. The contextualization of all these elements within the wider landscape at regional level contributes to highlight a number of aspects that are essential for understanding the territorial relationships during this period. As a consequence, in the second half of the 6th century AD and throughout the 7th century AD, the landscape in the center of the Iberian Peninsula responded to the formation of a stratified social structure. The peasantry comprised the majority of the population, and also formed the economic basis of the system; they were in charge of the production of the agricultural surplus needed to maintain the social elite and the State, which, in turn, made this control of economic resources a manifestation of their social and political power. Through this control elites could assert their preeminent position, even though their economic capacity was limited (Wickham 2008: 10) The State, for its part, was able to develop an urban model, visible in Recópolis and also in Toledo, because it had the ability to extract and control economic surplus, which suggests that the fiscal system in place was at first efficiently designed. The extent of this success is transparently manifest in the landscape which surrounds these two cities, especially Recópolis, where the clearest material evidence for the concentration of surplus has been found. It is, therefore, necessary to understand that elites and the State imposed very different levels of coercion upon the majority of the population, and also that regional differences existed. This issue must be approached from a diachronic perspective: the phase of expansion of the Visigothic State – late 6th/first half of the 7th century AD – is different from the phase of decline that follows – second half of the 7th century/ early 8th century AD; this change is clearly reflected in the archaeological record (Olmo-Enciso 1998; 2008; 2010; 2015). Surplus was indeed produced, but it was

largely collected and invested by both the state and the elite in different levels of scale, as archaeology is beginning to show.

However, the reinterpretation of the period, and the written sources, based on the archaeological evidence, has its limits. The combination of palaeoenvironmental evidence with other pieces of evidence which suggest changes in the plant population, an increase in the degree of human pressure, the transformation of the productive structure and climate change, assist us in understanding a much more complex social horizon than has been previously acknowledged. From the mid-5th century AD, changes began taking place in the landscape – in the settlement pattern, the economic structure, the organization of the agroecosystem and also the natural landscape. The range of these phenomena can only be understood in the context of the Early Medieval Cold Episode. In general, these processes must be observed from a multi-scalar approach, especially in the Iberian Peninsula, which is extraordinarily varied in cultural and bioclimatic terms. Although the data are still scarce and regionally uneven, they are sufficient to begin constructing solid working hypotheses. For the south of the Castilian plateau, combining regional and local/micro-regional scales of analysis contributes to a better understanding of the different speeds at which different aspects of the landscape responded to change. According to the palaeoenvironmental data collected, these changes involved the intensification of the prevailing agroecosystem – deforestation, the formation of open grazing areas, the breaking-up of new fields, etc. –and the diversification of economic activities in the face of dry Mediterranean conditions. One of the challenges faced by researchers is to understand the relationships between the settlements and the agroecosystem, as well as the social implications of climate change. In the center of the Iberian Peninsula, despite the fact that a large number of hamlets and farmhouses have been excavated, the physical organization of the rural economy, which is interpreted on the basis of palaeoenvironmental evidence, is still unknown. The relationship between the countryside and the cities poses a similar challenge. Recópolis is the only site at which the impact of the anthropization of the landscape that followed the foundation of the city is beginning to be documented. The record bears witness to the real scale of the enterprise: intense deforestation, the creation of new hamlets and farmhouses, the reorganization of the road network and the organization of the productive land around agriculture and stock-keeping, with the introduction of new agricultural morphologies. This stands in sharp contrast with other areas of the Peninsula, for example some regions in Galicia, where the intensity of a process of change – began in the 5th century and consolidated in the late 6th century – manifested in the construction of terraces, has been attested. The reorganization of the agricultural system resulted in a considerable increase in arable land (Ballesteros Arias 2010). The construction of these terraces has been interpreted as a response to the increase in erosion caused by deforestation and climatic change (Martinez-Cortizas 2005), which in combination with social factors can contribute to accelerate the changes affecting the landscape (González Villaescusa 2002: 50). Also, it is important to ascertain whether climatic changes had an effect on other phenomena such as the epidemics and famine that took place in the Mediterranean and Europe between the 6th and 8th centuries AD (McCormick 2012: 197-8).As has been demonstrated, Recópolis was situated in the midst of an open, almost steppe-like, landscape caused by the arid climatic conditions, as corroborated by lake water levels and speleothem analysis; during this period, the region also suffered droughts, bad harvests, famines, epidemics of *Yersinia pestis*, and swarms of locusts. According to the written sources, these resulted in extreme poverty and inequality (Olmo-Enciso, 2018a: 202-203).

The arguments and the evidence presented thus far demonstrate that the landscape in Early Medieval Iberia was more complex than previously believed. A stratified society, with different degrees of closeness in the (vertical) social relationships between peasants and elites, which had to develop a social response to the effects of the climatic crisis and which, through this, developed a new agroecosystem, and a new productive structure in relation to the settlement pattern. All of this points to a society defined by spatial inequality, a society in which elites and non-elites lived different and unequal but intertwined lives (Olmo-Enciso 2015: 41-2).

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Archaeology of medieval peasantry in northwestern Iberia

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Abstract

During the last 15 years, an in-depth renovation of the study of medieval landscapes has taken place in the northwestern quadrant of the Iberian Peninsula as a consequence of the boost in preventive archaeology, of the execution of large projects and of the development of integrated geo- and bio-archaeological researches. In this context it has been possible to develop a holistic and systemic approach to landscapes that has led to the overcoming of the traditional limitations of individual sites and the incorporation of the analyses of the productive spaces and the systemic relations between the different kinds of available records. The aim of this paper is to briefly present the theoretical and conceptual bases the Heritage and Cultural Landscapes Research Group (University of the Basque Country) has been working on in different areas of this part of the Iberian Peninsula. Emphasis will be specifically put on peasantry as a key agent in the modelling of historical landscapes.

Keywords: Rescue Archaeology, Landscape Archaeology, Social Inequality, Environmental Archaeology, Villages, Local Societies

Introduction[1]

30 years ago (1985), a conference held in Huesca marked the birth of Spanish Medieval Archaeology.[2] Hence, the Iberian post-classic archaeology is perhaps the youngest of all Western Europe. Born in the periphery of an academy focused on prehistory and classic archaeology, the first Spanish Medieval Archaeology inherited a clear preference for monumental and elitist evidences. The analyses of castles, churches, decorative arts and cemeteries (especially those with furnished burials) were the main goal of archaeologists until the 1980s and 1990s. In fact, the first domestic architectures built with perishable materials were only discovered at the beginning of the new millennium (Vigil-Escalera 2000) while landscapes remained out of the priorities of medieval archaeology in the overviews of those years (Riu Riu 1999).

During the 1980s a new Islamic Iberian archaeology broke this tradition and proposed new approaches, methodologies and topics. Heavily influenced by the French tradition and the so-called 'extensive archaeology', the analyses of irrigated agrarian spaces completely changed the interpretation of rural Islamic landscapes (Noyé 1998; Barceló *et al.* 1996). This approach, based on the integration of written evidence, place-names, and archaeological evidence of irrigated agrarian systems, has prompted the progress of a powerful Andalusian archaeology. It has focused on the analyses of social structures through their landscapes, the study of taxation and the State or the articulation of rural areas (Carvajal 2014; García Porras 2014). Thus, it has been possible to address a broad agenda of far-reaching historical problems (Gutiérrez Lloret 2015).

In contrast, the archaeology of the 'other' Iberian medieval societies[3] failed to achieve such a profound conceptual and methodological renewal in those years. In quantitative terms, however, it still accounted for most of the works published in meetings and congresses such as the Spanish Medieval Archaeology. The lack of a critical mass of researchers in the North and inner Iberia, their prevailing non-university character and a missing independent agenda prevented, except in specific cases, the implementation of a true archaeology of medieval landscapes.

These constraints came across the first territorial analyses on Christian societies in the Northwest of Iberia from the 1990s. Thereafter, the new regional governments promoted archaeological inventories. These were the basis for new approaches that can be better defined as 'archaeologies in the landscape' rather than landscape archaeology, strictly speaking.

[1] This paper has been submitted in 2016. As a consequence, the references were last updated in April 2016.

[2] The proceedings of the first congress of Spanish medieval archaeology were published in Zaragoza in 1987. On the historiography of medieval archaeology in Spain see Gutiérrez Lloret 1997: 53 ss; Salvatierra Cuenca 2013; Quirós Castillo 2009, 2014.

[3] Cfr. the titles of some of the contributions in Gelichi, Hodges (eds) 2015.

Landscape was then conceived as a political and fortified space (Gutiérrez González 1995) or as a mirror of sociopolitical dynamics that materialize in settlement patterns (Pastor Díaz de Garayo 1996; Larrea Conde 1998; Martín Viso 2000; Escalona Monge 2002). Thus, J. A. García de Cortázar did not hesitate to consider the analysis of the settlements as the main variable for the study of feudalization in Northern Iberiain the 90s (García de Cortázar 1999). There were approaches with a denser notion of landscape archaeology (Ariño Gil and Rodriguez Hernández 1997; Fernández Mier 1999), but the limitations of the available records prevented addressing agendas similar to that existing by then in other European territories.

The breakout of this formalistic perspective on 'territorial archaeology' aimed at defining settlement patterns finally took place in the new millennium. It was the result of a reconceptualization of landscapes as the embodiment of multidimensional social practices and the development of research lines such as the agrarian and palaeoenvironmental archaeology, but also stemmed from the increasing technification of methods and devices and the implementation of intensive projects.

It is clear that by the late 1990s the development of commercial archaeology played an important role in this change of perspective, leading to a substantial renewal in the study of medieval societies of northwestern Iberia. The remarkable increase of private and public building activity in Spain between 1998 and 2008 and the construction of massive public infrastructures (pipelines, highways, railways and others) meant the development of large-scale archaeological projects for the first time. In this context some companies were forced to assess the archaeological value of dozens of hectares using resources unknown to the academy. The traditional approach based on the study of single sites defined mainly in monumental terms proved to be totally ineffective to overcome this challenge. As a result, new strategies and methodologies were tested and then applied. Some of these new topics and protocols, such as bioarchaeological and geoarchaeological analyses, were borrowed from the prehistoric research. Others were developed at the archaeological sites themselves by the companies and the academy. And even if some of these processes were also verified in other European countries during the same years, the main point we would like to make here is that the theoretical background used by some academics and commercial archaeologists in northwestern Iberia has crystallized into a landscape archaeology focused on peasant agency.

Surprisingly, the different paths followed by Andalusian archaeology and that one carried out in the rest of Iberia seem now aimed at mutual distrust. The attempts to standardize northwestern archaeology with European research agendas have been regarded as suspicious, while the exceptionalism of Andalusian archaeology is claimed as a reaction against the alleged Eurocentric universalism that mainly comes from the Anglo-Saxon core (Gutiérrez Lloret 2015: 51-2). Do we really conceive the villages on both sides of the border so differently? Were their internal social dynamics substantially the same or very different? How does the integration of local societies in state systems work? How can we explain the early conversion to Islam of rural communities in some areas of inner Iberia? Do the specialized craft systems reflect centralized political structures? How did the de-centralized storing of strategic food supply work? The list of questions involving the research on Iberian medieval societies could be further extended. Perhaps, the appropriate basis for comparative analysis is still lacking.[4] This is an essential conceptual framework for the study of medieval European societies (Wickham 2005). Promoting the binary opposition between 'medieval archaeologies' does not seem a suitable alternative to address the many difficulties faced by all archaeologies in southern Europe.

To build the foundations of this and other comparisons it is necessary to discuss and clarify the conceptual basis on which we analyze past societies. The aim of this paper is precisely to discuss this in the light of our experience, some of the main concepts used to study the landscape as the materialization of social practices. More specifically, our focus will be on the notion of site, the concept of an archaeology of villages and on the analysis of local societies. The main purpose of this work is to contribute to an unhurried and dispassionate debate which has not always been present in the archaeological study of medieval societies of the peninsular northwest in recent years.

Archaeology of medieval landscapes in northwestern Iberia

First of all, it seems appropriate to explain some of the conceptual frameworks on which our research group has built an agenda based on the archaeology of landscape. Due to the circumstances under which it has developed, it has partly been an autonomous path, but it also borrows its theoretical background from Mediterranean, British or Mesoamerican experiences (Barceló 1988; Reynolds 2009; Higham and Ryan 2010; Cambi 2011; Feinman 2015). We also share some of these assumptions with other active research groups,

[4] Just to emphasize one (apparently nominal) contrast: the archaeology of al-Andalus has had a distinct identity in academic terms and in regard to its subject since its inception; categories such as Christian or Visigothic archaeology are clearly inadequate for conceptualizing the archaeological practice in the Early Medieval Northwest. Thereby, some groups have preferred to use approaches that put the accent on the archaeology of peasantry, the agrarian archaeology or the archaeology of medieval landscapes.

very active in the Northwest of Iberia (Ballesteros 2006; Tente 2012; Fernández Mier 2014).

The concept of 'landscape' in archaeology is both polysemic and ambiguous. Indeed, landscape archaeology has been reinvented many times. Therefore, this concept includes very broad operational contexts, sometimes hard to define. In any case, it may be useful to consider that 'landscape archaeology' is the proper term to refer to any academic approach which concentrates on the social construction of space (Meier 2012: 509).A contextual deconstruction is needed from this general definition in order to establish the conceptual basis from which different 'landscape archaeologies' have developed, as M. Johnson did the same in the British case (Johnson 2007). Given this background, the path followed by our research group in the study of medieval societies through the analysis of the landscape has been structured around these main areas:

1. Preventive archaeology, mainly developed outside academia, has carried out conceptual, methodological and operational innovations to acquire and analyze the archaeological record in extensive terms. It is from these achievements that landscape archaeology has succeeded to emerge. These new archaeological practices, reinforced later from the academia, allowed us to recognize the materiality of early medieval subaltern groups, hitherto largely unknown (Vigil-Escalera 2000).It has also made possible the diachronic analysis of peasant landscapes, taking into account the logics of rural communities throughout history from cross-cultural approaches. Storage systems, the various forms of housing, the aggregation of population, etc. have been considered (Díaz del Río 2001).Furthermore, the large spatial scale involved in many projects of preventive archaeology led to the clearing and excavation of many hectares. Thus, the exposed landscape has literally become the subject of archaeological study. As a result, the long standing concept of the archaeological site was called into question and has undergone a radical re-thinking (Quirós Castillo 2010).
2. A second axis, essential to our understanding of the archaeology of landscape, involves the need to identify and specify the subjects of historical processes (Barceló 1988). It has become clear in our case that the central historical subject in the construction of medieval landscapes has been the rural community. The number of villages and rural settlements excavated in the Northwest of Iberia is quantitatively superior to that of any other known type of occupation in the Middle Ages. From our theoretical perspective, the construction of solid and complex historical accounts must primarily arise from the agency of local societies and subaltern groups. This approach is relevant for two main reasons. First, we know that more than 90% of medieval societies were formed by peasants (Wickham 2005). Second, it allows us to assess an autonomous (not independent) line of research in regard to the medievalism. In short, it gives people without history a voice, to use the fortunate expression of Eric Wolf (Wolf 2005), and it is an exciting challenge for Historical Archaeology.
3. The archaeological study of the medieval peasantry in its double aspect of social inequality and social relations does not imply to focus only on the analysis of villages, farms and rural sites. Quite the contrary, it has prioritized the systematic analysis of landscapes, overcoming the disciplinary splits that had previously made any dynamic analysis of medieval societies incomprehensible. For example, we have tried to break the gap between burial archaeology and settlement archaeology, arranging in a consecutive same narrative phenomenon that had long been analyzed separately such as post-Roman or Douro necropolis and 'Visigothic' cemeteries (Vigil-Escalera 2013). It has been possible to provide a broad context to some early medieval churches. Projects such as Aistra or Torrentejo have reconciled church archaeology and settlement archaeology (Quirós Castillo and Santos Salazar 2015). We have also been able to analyze the political geography of local societies through the correlation between castles and villages or to discuss the relationship between production systems and sociopolitical complexity (Vigil-Escalera and Quirós Castillo 2013). To sum up, when referring to systems, we need to go beyond the analysis of individual components and achieve a dense knowledge of the relationships between them.
4. A fourth axis of the practice of landscape archaeology has been the use of a holistic and interdisciplinary approach, paying particular attention to environmental issues. Two points deserve special mention here. Firstly, when we refer to the hackneyed concept of interdisciplinarity we are not talking about a strictly methodological issue, but to an approach that values the peasant agenda in a multi-vocal way. Secondly, historical archaeology in southern Europe lacks a strong track record as environmental archaeology. It was necessary to collaborate with specialists accustomed to the analysis of prehistoric societies. They had both a methodological background and scientific concerns very different from our project. Adaptation was not easy, and it was sometimes

preferable to train new specialists retaining the best of both academic traditions. Valuable territorial work on these records is already available (Requejo Pallarés 2013; Hernández Beloqui 2015; Grau Sologestoa 2015). However, we are still far from a widespread environmental archaeology. There are numerous paleo-climatic and paleo-environmental records that have not yet been either analyzed or problematized.

5. A fifth key feature of archaeological work on medieval landscapes comprehends the need to carry out inter-regional comparative analysis. Medieval local societies are highly fragmented entities, especially during the Early Medieval period. The diversity of historical processes is therefore high, as has been occasionally noted (Quirós Castillo and Vigil-Escalera 2007; Quirós Castillo 2011). Comparing territories is always difficult because it requires the standardization of concepts and reprocessing of analytical tools. This is extremely hard in our territory for several reasons, mainly due to the lack of monographs and case studies published in detail and to the lack of consensus on the analytical categories. However, as it has been pointed out, comparison is not an option in the study of local societies (Wickham 2005).

From our perspective, in short, landscape archaeology requires that landscapes were treated as the materialization of social practices in spatial terms. It becomes the main research objective from a holistic, systemic, comparative, and materialist approach, and should especially focus on peasantry.

In the following sections we will address two main themes in the study of medieval landscapes of Northern Iberia: the archaeology of villages and community practices, and archaeology of local societies.

Archaeology of medieval peasantry in northwest Iberia

In contrast to the political landscape of the Roman Empire, formally subjected to the city, medieval landscapes exhibit a multiplication of new political actors. Ancient urban centrality is firstly challenged by new fortified sites with very different entities and natures. Sometimes they could compete with the city; sometimes, the city must have relied on them to exercise its domain in remote territories. Below, a mesh of rural open settlements replaced the abandoned late Roman *villae*. In the following pages we will address the study of these latter mostly peasant sites.[5]

The archaeology of villages and communitarian practices

One of the first objectives of this project has been to carry out a characterization of local societies from the location and analysis of the settlements of peasant communities. It is hardly questionable now that the post-Roman settlement in the Northwestern quadrant of Iberia is structured essentially on villages. In fact, it is quite difficult to draw the historical development of those regions where villages (or some of their associated features, such as community cemeteries) could not be identified.

The ambiguity of the concept 'village' is mainly derived from the different meanings assigned to it by various disciplines (Zadora-Rio 1985, Quirós Castillo 2007). We refer to villages as the grouping of several households in a shared territory, stable enough over time to form a public cemetery. Attachment to the land, neighborhood and memory presumably derive in the consciousness of a self-identity, distinct from those of its surroundings. The village represents the realization of the social practices of a stable peasant community. The entity, nature and spatial organization and distribution of rural settlements may however be quite different over time and from one region to another, so it is not possible to define a single village type for the entire Iberian Northwest in the Middle Ages. Moreover, diversity and heterogeneity should be seen as the common pattern, although regional and sub-regional trends can be recognized.

Bearing in mind that the definition of the village is more dependent on the identity and the behavior of the social subject than on the shape or size of the inhabited place, it is clear that the trait that best characterizes a group of households as a village is the presence of spaces with a shared use. It may be considered that these are the material reflection of the existence of community practices or a cooperative enterprise. The unique identity of the village and its cohesion are substantially achieved through consensus in the governance and management of these non-private, common pool resources, and by its defense against claims or attacks from outside. The archaeological recognition of commons is far from simple. However, an increased attention to these issues has been devoted in recent years (Stagno 2016; Oosthuizen 2013, 2015, 26-ss.), and this includes the exploitation of woodland, upland pastures, water flows, or any defined area of natural resources subjected to common property rights.

Palaeoenvironmental studies in peat lands and archaeological sites spread across various sectors of the Iberian Northwest (Hernández Beloqui 2015) reveal

[5] Due to space restrictions, it has been impossible to take into consideration other types of evidence such as non-communal occupations or fortified sites, just to point out two types of settlements relevant when considering medieval landscapes in the Northwest of the Iberian Peninsula.

significant changes in the management of commons in this early medieval period with respect to the previous one. For example, in wetlands or peat bogs from mountain areas, a fairly widespread deforestation by fire and a parallel increase of grasses between the 6th and the 8th centuries has been identified. This forest clearing should have allegedly favored the creation and exploitation of summer pastures during the Early Medieval cold episode in many places: several sectors of the Douro valley and the Central System, in Campo Lameiro and Sierra del Xistral in Galicia, in La Molina and Monte Areo in Asturias, in Lago Arreo and Prados de Randulanda in Álava, just to mention some outstanding examples (Martínez Cortizas. 2005; López-Merino 2010; Kaal 2013; Hernández Beloqui 2013; Corella 2013; Pérez Díaz and López Sáez 2014; López-Merino 2014; Silva-Sánchez 2014). While the process of deforestation had been intense in the Cantabrian Mountains during the Roman period, in the Basque mountains and the Pyrenees pastoral husbandry was significantly underrepresented during this phase compared to the prehistoric period or the Early Middle Ages. One possible explanation for this dynamic would be the occupation of highlands by communities from the valleys that implement a regime of short-distance transhumance. This has been suggested in Sierra de Aitzkorri or Aralar: the presence of seasonal occupations in the high Cantabrian Mountains known as *bordas* in the Basque Country and also hay production are attested from the early medieval period (Fernández Mier and Quirós Castillo 2015).

The multiplication of these signatures of pastoral husbandry in the Early Middle Ages had been previously interpreted from primitivistic approaches, highlighting the contrast between the agricultural predominance of the Roman period and the (re) introduction of pastoral activities after the end of the Empire. However, that reading is contradicted by the evidence provided by other contemporary findings, such as, for example, the numerous grain storage-pits (*silos*) in the villages found at the valleys. Both types of records are most probably part of the same diversified productive system, quite different in nature from that working during the Roman period. They would have relied on well-integrated mixed farming and stable husbandry, with the logical gradations in terms of intensity and diversity of productive strategies. It can also be related to the expansion of chestnut cultivation in Asturias and Galicia (Muñoz Sobrino 2014). These seasonal small-scale husbandry activities do not seem compatible with a pastoral specialization within a market oriented system such as that documented in several Mediterranean regions during Roman times. The significant size reduction of the major livestock taxa from the 8th century onwards is another major phenomenon recently noted (Grau 2015b). It has been explained as a result of deep transformations of animal husbandry practices and of the adaptation to the smaller scale of peasant farms.

Another archaeological marker showing the role of rural communities in the management of commons is represented by iron production. The domestic scale of these activities may be suspected in the case of the Basque Country (Franco Pérez 2015; Alberdi and Etxezarraga 2015). Recent work carried out in this area has enabled the inventory of about 300 slag heaps, many of them related to *haizeolak* or shaft furnaces. They were held in communal areas, where the ore was extracted while charcoal necessary for reduction was produced. The dates available from the slag heaps and the excavation of some of these *haizeolak* show that these productive facilities were continuously active between the Roman period and the High Middle Ages, and that activity increased in the final phase of the Early Medieval period (Franco Pérez 2015). On the other hand, the values of lead and other heavy metals found in bogs like Cadela da Pena in Galicia from the seventh century confirm that this small scale metallurgical production was common in other areas (Martínez Cortizas *et al.* 2005). The evidence on mining and metallurgical activities is rather more sporadic in the inner regions, even though they share their small scale with the above mentioned. It is worth noting the following: reduction furnaces in El Castillón (Santa Eulalia Tábara, Zamora) (Sastre 2011) or Navalahija (Colmenar Viejo, Madrid) (Colmenarejo 2014); the continuity of the settlement and probable copper production in Cerro Almadenes (Otero de los Herreros, Segovia) (Salas 2014); or the metallurgical evidence detected in La Mata del Palomar (Nieva, Segovia) (Tejerizo 2015) or Vadillo (Soria) (Taracena 1934).

Nevertheless, the collective action undertaken by early medieval village communities is perhaps most obviously recognizable through the processes of construction of agricultural terraced plots. The archaeological study of twenty existing agricultural areas in Galicia, Asturias, the Basque Country and the Cuenca del Duero has concluded that the imprint of early medieval communities in shaping traditional landscapes has been decisive (Quirós Castillo 2014b). Geo-archaeological and stratigraphic analysis of systems of terraced agricultural plots has shown that the earliest stages of traditional agrarian landscapes should be dated between the 5th and 10th centuries, revealing a significant variability in their onset. Two main construction stages may be suggested in the Basque Country, while in Asturias they are only visible from the 8th century and they appear during the 7th century in Galicia. Moreover, the building processes of these agricultural systems may have involved a very significant mobilization of labor (and volumes of earth) in short periods. This allows us to infer the action of organized groups of people that could have eventually

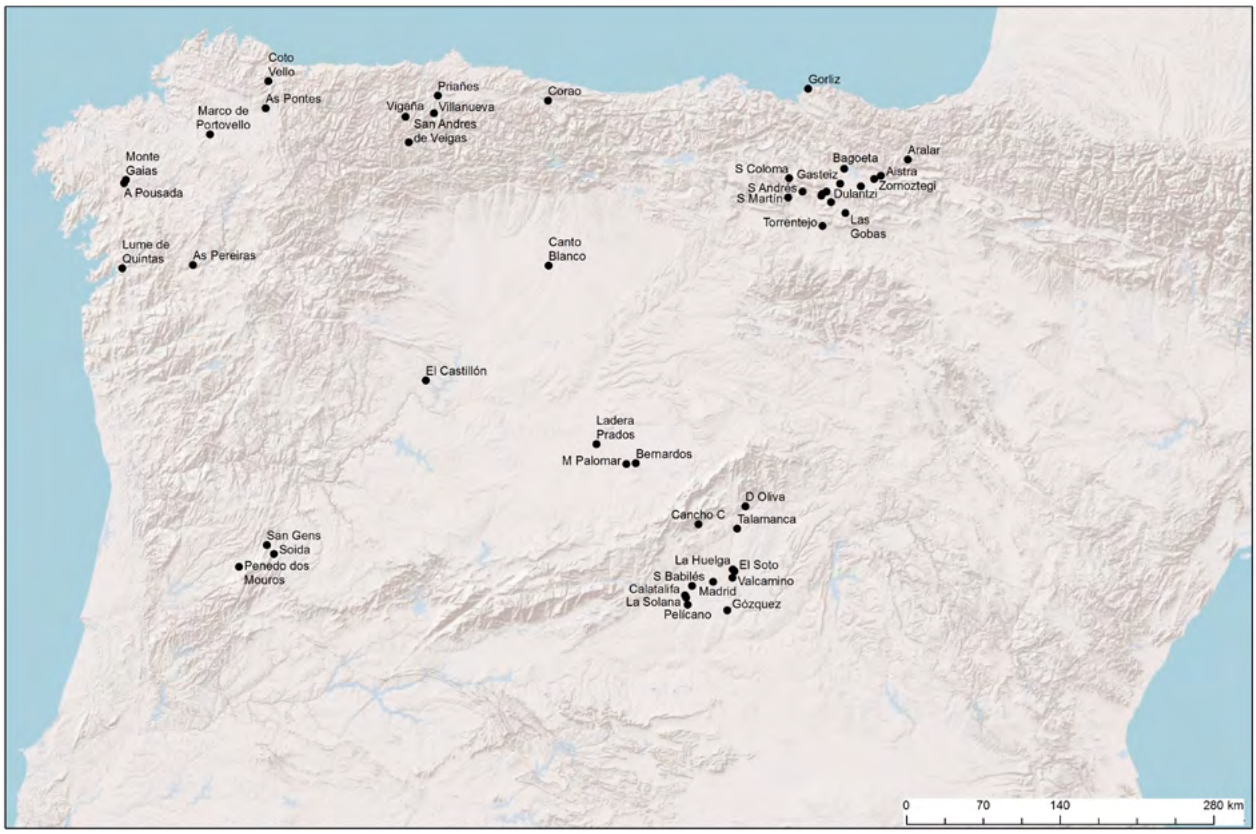

Fig. 1. Map with the main sites cited in the text.

transformed large productive spaces, as has been noted in Monte Gaiás (Santiago de Compostela) or Torrentejo, in Álava (Ballesteros 2006).

In short, in the light of these markers it can be concluded that one of the most important phenomena that characterized the Early Middle Ages is the formation of village communities that have intensely modelled the rural landscapes. These communities were responsible at the same time for socio-political dynamics that remained opaque to the written sources.

It must be stressed that, unlike other European countries like the United Kingdom (Fullford and Holbrook 2011), we do not know the Late Roman peasantry from the Northwest of our territory[6] well, as few cases of peasant occupations have been investigated during this period, as is the case with farms like the one in Priañes (Requejo 2013), Zornoztegi (Grau Sologestoa and Quirós Castillo 2017) or as Pereiras (Aboal Fernández and Cobas Fernández 1999), as well as prehistoric occupations or the later phases of the villas and hillforts (*castros*). However, even with all these precautions there are sufficient indications to make us believe that the emergence of new ways to socialize in the Early Middle Ages constituted a very important change in the Northwest of the peninsula, although there are important geographical differences. In Galicia or the Cantabrian strip it has been suggested, for example, the existence of specific areas which have been associated with stable communities since the proto-history of the Middle Ages, while this point of view is questioned in other sectors such as in the Castilian or in the Duero area. In any case, the spatial and occupational continuity does not imply the continuance of social subjects or the political significance of the residents. In other words, the coincidence or geographical proximity between, for example, the forts and the towns in the Northwest, do not necessarily entail a consistency between ancient and medieval communities.

This peasant agency finds its correlation in the analysis of settlement areas. The archaeological study of villages and other forms of settlement where the communal component is missing or not perceptible,[7] has also met with an important evolution in recent years. Around fifty settlements have been investigated until now in different areas of the Northwestern Iberian Peninsula with varying degrees of extent and

[6] This not only happens in the Northwestern Iberia; it is a common situation which is only now beginning to be remedied (Ghisleni *et al.* 2011; Vaccaro *et al.* 2013).

[7] We have regularly described these sites as 'farms' and can be described by the lack of cemeteries linked and the limited number of domestic units. Sometimes this description could be related with a partial knowledge of the archaeological records, and should therefore be used with caution.

depth, yet again showing the significant geographical and diachronic diversity (Figure 1).

The southernmost area of study offers a valuable contrast with the rest of the territory. The Tajo valley included in the region of Madrid has been one of the most privileged areas in terms of preventive archeological investigations carried out over the last 20 years and, as a consequence, this is one of the areas where traditional landscape was most intensely destroyed (Strato 2013). The numerous sites excavated (settlements and cemeteries), in addition to those known just by field surveys[8] allow us to offer a detailed description of the changes in the countryside after the collapse of the Roman Empire. Consequently, quite a precise account of the evolution of the rural population between the 5th and the 6th centuries has been developed, especially during the elusive 5th century (Vigil-Escalera 2015). The early development of rural communities in this area shows a strong correlation with former Late Roman occupations. It has been suggested that the sparse occurrence of fortified settlements, generally limited to mountain areas (Dehesa de la Oliva, Cancho Confesionario),could be linked to the political strength acquired by the city of Toledo (capital of the Visigoth Kingdom from the 6th century), whose sphere of direct control extended north to the Central System. The period of maximum activity of these first-generation castles is registered during the first two thirds of the 5th century (Vigil-Escalera and Tejerizo 2014). A village network appears to be fixed from the end of the 5th century or beginning of the 6th century and remains considerably stable until the first half of the 8th century. This pattern shows a notable density, with centers arranged alongside streams separated by 3 to5 kilometers. Numerous village community cemeteries used simultaneously are documented. In some of them furnished burials with 'Visigothic' characteristics have been found (Cacera, Gózquez, Boadilla) while in other neighboring sites these items have not been found (Quirós and Vigil-Escalera 2011). Nevertheless, as can be expected, material culture is very similar in all villages, as much in the domestic architecture as, for example, in the pottery assemblages.

The bioarchaeological analyses carried out (Vigil-Escalera 2014) reveal an intense agricultural production based on different cereals and legumes complemented with livestock breeding adapted to local resources. The economic diversification typical of a peasant system however, allows for a certain degree of flexibility. Thus we have found exceptional evidence of the use of an olive grove for the production of oil (Gózquez), or percentages of equid which could testify to a non-negligible degree of commercial exchange of various products between communities.

The system suffers an intense deconstruction following the Islamic conquest, during the first half or the second third of the 8th century. This results in either the abandoning of almost all known villages (Gózquez) or a residual population remaining in them for some time (Pelícano). However, the occupation of some minor locations along the banks of the Jarama river persisted (El Soto, La Huelga), where an early conversion to Islam of the locals can be observed (Vigil-Escalera 2009). It is presumed that a large proportion of the population of the villages could have moved to the suburban outskirts (as in Vega Baja, in Toledo) or gathered in a reduced number of fortified enclaves. In approximately one century (750-850), those foci could have seen their organization officially recognized as Arabic cities of the Emirate (Madrid, Talamanca, and Calatalifa). The imposition of a new urban-based taxation system could explain the nature of these deeps changes.

Carlos Tejerizo's recent doctoral thesis about settlement patterns in the Duero basin suggests that the formation process of peasant communities took place over two separate periods. The first was performed during the 5th century, when peasant groups got defined in a new sociopolitical environment. They appear to revolve around a first generation of castles and both are linked to a series of 'post-imperial necropolis' equipped with grave goods which represent the internal tension of these communities and within rival local authorities. An important change can be detected around the year 500. Most of the villages were deserted and a new generation of villages and farms emerged. These villages will remain active until the Islamic conquest. In the meantime, 'post-imperial necropolis' were replaced by new communal cemeteries. These have been considered 'Visigothic necropolis' by the traditional historiography. At the same time many castles were abandoned (such as Navasangil, Bernardos). Following the Islamic conquest, the disintegration of farms and village networks is detected in a political context which has been defined as a stateless territory. Probably, where the village-based sociopolitical system was not deconstructed, the emergence of new political formations opposed to the southern statewas possible. Additionally, it is within this context when the expansion of the Astur Kingdom to the south of the mountain range occurred from the 8th century onwards, impacting on a highly fragmented system. The complex social insertion mechanisms in the Kingdom of Asturias have been studied by Alvaro Carvajal in his thesis (Carvajal 2013), but at present they are not reflected in the archaeological evidence. One of the few settlements that was occupied during all the Early Middle Agesis the village of Canto Blanco, in Sahagún, identified with the Valdelaguna center mentioned in

[8] It is one of the few areas of the Peninsula with a very accurate Inventory of archaeological sites.

the year 905 and which was in use from the Visigothic period until the late Middle Ages (Tejerizo García 2017).

The first evidence of medieval villages in Galicia can be traced from the 7th century onwards. This is the case of A Pousada, near Santiago de Compostela. It has been investigated within the framework of a preventative project (Blanco 2010). The limited extent of the excavation has hampered an in depth characterization of the site, although we should point out that the chronologies of the initial phases coincide with those detected in the nearby agrarian system of Monte Gaiás. Indeed, very consistent studies conducted in terraces and agrarian fields had confirmed that the 'traditional agrarian landscapes' were created in Galicia in early medieval times (Ballesteros 2006; Ballesteros Arias and Blanco Rotea 2009).

These chronologies also coincide with what was observed in Asturias, although at the moment only a few sites have been studied. In the Santo Adriano de Villanueva archaeological project carried out by Jesús Fernández, the medieval village can be detected mainly from the agrarian uses of the inhabited site and some negative structures excavated in deposits dated to the Roman period. The first fields with a presence of *Cerealia* pollen associated with chemical indicators of intense agrarian practices and fertilization through domestic waste can be dated to the 7th century. 'Dark earth' deposits have been dated to the 9th to 11th centuries which are the result of the accumulation of domestic waste in which black and grey pottery from the Early Middle Ages appear (Fernández Fernández 2013).

Another currently inhabited village studied in Asturias is Vigaña Arceu, in Belmonte. The project, led by Margarita Fernández, discovered a very long occupation from the prehistorical times. The discovery of a 7th century furnished burial in the old parish cemetery, in whose proximity some constructions dated to the Early Middle Ages were found, must be related to the Sienra agrarian fields, in use since the 8th or the 9th centuries. The chemical analyses of these agrarian deposits have verified practices of intensive fertilization by means of domestic residue and manure, which allows us to infer the existence of nearby domestic units (Fernández Mier 2014).

It is quite possible that the findings made in San Andrés de Veigas, in Somiedo identified by Ms Arqueo with the monastery of San Andrés of Cogega mentioned in 1082, may also correspond to a village with the same characteristics, keeping in mind that the oldest domestic structures found are dated between the 8th and the 10th centuries (Sánchez Hidalgo and Menéndez Granda 2013).

Nonetheless, the very first peasant occupation found in Asturias was excavated in the Güeña Valley, in Vega de Corao, by Otilia Requejo. A preventive intervention of approximately 50 m^2 allowed three partially destroyed structures to be uncovered. They were made of stone and covered with tiles, and were dated to the Early Middle Ages. They were in use during the period of the Astur Kingdom (Requejo and Gutiérrez González 2009).

However, it is in Alava where we have a denser archaeological record related to rural communities resulting in the systematic excavation of abandoned villages (Zornoztegi, Aistra, Zaballa, Torrentejo, San Martín, Bagoeta, San Andrés, Santa Coloma, Las Gobas, Mutilluri) and inhabited areas (Vitoria, Dulantzi, Laguardia). Some of these settlements began in or lasted through to the 5th century, as is the case of Zornoztegi or Dulantzi. Nonetheless, it is between the 7th century and the 8th century when most of these villages were founded. It is at this time when a dense network of villages is created in Alava, resulting from the coming together of the population, presumably due to the abandoning of previous occupations. In some cases, these villages were laid over earlier farms (Zaballa, Zornoztegi), while in other cases they were new foundations (Bagoeta, Torrentejo, San Martín). In addition, we can see an important sub-regional difference between the villages founded on the banks of the Ebro River (as in the case of Torrentejo, San Martín or Mutilluri) or in Bizcay (Gorliz) with respect to the center of Alava, due to the fact that the initial chronologies are the oldest. This asymmetry can possibly be explained as a result of the different degrees of political maturity which existed between the various regions and because of their individual territorial dynamics (Quirós Castillo 2016). These dates are also consistent with the transformations which were observed in the mountain areas and with the constant reduction of the percentage of pollen trees which has been documented in some settlements, resulting in the transformation of the landscape (26-38 % between the 4th and the 5th centuries, 11 % in the 8th and 9th centuries) (Hernández Beloqui 2015). Another phase of new foundations (Treviño, C. Arganzon) and deep transformation in previous villages can be dated around the year 1000, a time of institutionalization of sociopolitical inequalities at a local level related to the formalization of sub-regional political realities as the counties of Castile and Alava.

Consequently, the available data points towards the idea that the process of unifying a rural population and the formation of villages was a complex phenomenon, and geographically differenced within the territory in the Northwest of the Iberian Peninsula. While in the Northern area this process became visible in the inhabited places and in the management of the communal resources during the course of the 7th and 8th centuries, in the Duero basin this phenomenon followed different dynamics, similar to those seen in other

sectors of the interior of the Iberian Peninsula, as in the surroundings of Toledo. The casuistry would expand if we took into consideration the Estrela mountain range in Portugal, the Sahagún territory or the Castilian area. But in general, the entire territory appears to be hinged on villages with varying morphologies sometimes equipped with a solid collective identity (Tente 2012; Vigil-Escalera and Quirós Castillo 2013; Tejerizo García 2015).

Secondly, not all villages and farms are similar in social or agency terms. And although many of them lack obvious internal hierarchies, which complicates the analysis of their internal social structure as has been carried out in northwestern Europe (Loveluck 2013), there is more than enough evidence of the important hierarchies which existed within the peasant world at varying levels (Vigil-Escalera and Quirós Castillo 2013).

In third place, we must conclude that it is impossible to establish a simple and lineal correlation between sociopolitical dynamics and the agency of rural communities. The dynamism of the communities is much greater than previously assumed and it is hard-pressed to directly reflect the transformations which took place at a state level. In other words, what effect did the formation of the Visigothic Kingdom, the conquest of the year 711, the creation of the Astur Kingdom or their expansion or the formation of the Castilian county have on local societies? Although it may be fair to expect to make connections between both levels of action, there are agencies and intermediation levels which explain the existence of discrepancies and of different agencies as a result of the way in which the main powers are explained in this territory throughout the Early Middle Ages.

Therefore, at an analytical level, we should separate the various levels of action taken in order to highlight, among other things, the mediation formulas which have allowed the construction process of the multiterritorial states by means of complex interaction practices between the local elite and the peasant communities in one direction, and between these very same elite, the sub-regional aristocracies and heads of state in a vertical direction.

Archaeology in local societies

A calm reflection of the empirical mass generated during these last year's allows us to move beyond the initial analyses mostly centered on individual sites to adopt a more systemic view of the functioning of early medieval local societies. It is then possible to visualize the fallacy of primitivistic viewpoints from the past, dismissing the possibility that peasant communities could live in social, economic and political isolation. Despite the undeniable processes that led to increasing regional differentiation, new evidence support the substantial degree of mutual interrelation maintained between local communities.

It is then possible to suggest that some economic complementarity between ecological niches was achieved in different areas within the same region. This is clearly visible, for example, in the specific productive orientations of the riverine plains (with high agricultural yields) and the mountain areas (where livestock production prevailed). Most mining, metallurgical or extractive activities are concentrated in the latter, as it has been mentioned earlier. The wide distribution of rotary handmills, silex tools or quernstones suggest the operation of fluid exchanges between producing and consuming zones. Regarding the pottery, the family resemblance of wares on a regional scale seems to suggest that the same craftsmen or artisan teams with very similar knowledge and skills were who supplied rather extensive areas with products of distinct qualities. Handmade vessels, strictly household products, play a very limited role in the whole area and are hardly significant with the exception, perhaps, of the Cantabrian fringe.

It would be reasonable to think that most of these exchanges (products, information, services, even marriage alliances) were set up preferably in fixed places with a precise seasonal scheduling well known to all. It is clear that some major meetings (the most important political, religious or judicial assemblies, fairs and markets) were held in urban centers, but others were probably outdoor venues held in the most convenient location for the peasant communities in a particular area. The archaeological footprint for these types of sites is significantly more difficult to detect than established settlements or stable marketing places (Arthur 2000; Hirth 2010). Faced with many difficulties, recent research has in turn achieved significant progress (Foreman *et al.* 2002; Carver 2015). Exciting research projects have taken shape in many areas of northern Europe (Pantos and Semple 2004; Sanmark and Semple 2008; Brink 2011; Baker and Brookes 2015; Iversen 2015) but much less attention has been given to these issues in the Mediterranean regions.

None of the villages archaeologically investigated to date has provided evidence of the existence of places of worship in the 6th-7th centuries.[9] This virtual absence of churches supports the theory of their late appearance in the early medieval countryside. It is therefore quite difficult to assess to what extent the Christianization of the rural communities was a well-established reality or a virtual desire of the political and religious authorities of the Visigothic Kingdom. The swift adoption of Islam by certain rural communities (as seen for example in several sites in Madrid) could perhaps be linked to the

[9] Dultantzi, in Alava, is an exception (Quirós Castillo *et al.* 2013).

first alternative. In any case, the location of those first churches[10] and especially the fact that they were built in previously uninhabited places should be emphasized.

Contrary to what could be expected, the construction of the first rural churches in the center of the Iberian Peninsula took place not in the more dynamic and thriving villages, but in places which could initially appear to be unconventional within the network of existing settlements. A quite preliminary review of the evidence provided by a handful of sites from the region of Madrid suggest that the place to build those primitive churches could have been chosen because of its previous and effective centrality in the social, ritual, political and economic development of clusters of surrounding villages (Rodríguez 2015). Archaeological research on sites such as La Solana, San Babilés or Valcamino has just recently begun. These sites usually occupy prominent places, visually significant with respect to their surrounding ground.[11] None of them show signs of stable settling during the 5th and 6th centuries. However, they all reveal elements suggesting the presence of prestigious buildings founded in the late 7th or 8th century. Despite the difficulties to track the historical continuity of the rural communities settled in this area (they were inserted for four centuries in the political structure of al-Andalus) it seems possible that some special meaning attributed to these sites endured. Or at least, that is what might be inferred from the re-founding of churches at those same places after the conquest by the Christian Kingdoms (late 11th century). The above mentioned sites were significant political, religious and trading venues for the neighboring villages until quite recently. Seasonal religious processions converged every year on them. Peasant assemblies (*Concejo de la Tierra*), fairs and communal banquets were the most prominent social and political events held there (Vigil-Escalera in press).

These exceptional sites are a real challenge for archaeological research in the future. Revealing the precise features of the early medieval frequentation of these complexes, before and after the construction of the earliest places of worship, certainly deserve extra efforts. It is unknown yet whether the functions of these congregational rural centers before the Industrial Revolution could be directly inherited from the Early Middle Ages, before the formalization of the parish network. When working with such long time spans, we must always consider that changes of location and spatial rearrangements must have been common. For this reason, these possible exceptions to the rule are particularly attractive as fossilized elements of relict landscapes.

The discovery of possible traces of archaeological activity in these communities (larger than the village or the settlement unit in their social, political and economic aspects) enables a more global and ambitious knowledge of local societies in the Early Middle Ages and provides a new meaning to the archaeological landscape. Moreover, this opens new ways to comprehend the collective identities above and beyond those which form part of the village or borough and their respective cemeteries. These approaches offer fresh insights into the operation of early medieval peasant communities and make it possible to fully explore their presumed links with the traditional rural societies.

Discussion and closing remarks

In conclusion, the two main topics we have tried to address through the analyses of medieval landscapes in the Iberian Northwest have been, on the one hand, the study of the peasant agency through the political micro-world of villages and, on the other hand, we have checked the dynamics produced at the heart of local societies as a result of the interaction between their different active partners (at a subregional level) and with central powers. This way, landscapes remained the focus of our study both as the outcome and as the means through which the agency of social subjects unfolds (Fernández Mier and Alonso 2016). This path has been marked by the overcoming of previous empirical approaches (Johnson 2011: 778-781) and the questioning of the excesses of post-processualism (Fleming 2006).

As a result of the growth of the critical mass of data and the increasing technification of extensive archaeological practices, a relevant volume of archaeological records is now available, even if many of them are still under construction. This work plan currently faces a series of operational and conceptual challenges which will guide future work.

First, the representativeness of available records does not yet allow the construction of in depth narratives on a regional scale. This is due to the marked imbalance of the geographical distribution of archaeological interventions. Paleoenvironmental records and the archaeological materiality of the villages support the existence of a broad territorial diversity which is easier to confirm than to explain in dynamic terms. The amount of evidence has increased substantially (e.g. the pottery or burial records have taken precedence in recent literature), but it continues to be extremely complex to formulate a comparative analysis between territories in the Iberian Northwest. This is one of

[10] To date, the identification of sporadic examples of Roman or post-Roman worship buildings across the Iberian Northwest still appears unconvincing (Sánchez Pardo 2015).

[11] This is in stark contrast to most peasant settlements. The new sites fit well with the standards and meaning of centers for 'sight communities' (Bernardini and Peeples 2015).

the reasons why the debate with other archaeological trajectories is being hampered, as indicated earlier in this text.

In addition, most of the archaeological interventions remain unpublished and concerning grey literature lacks any detailed analytical study. The widespread practice of preventive archaeology has signaled the awakening of a new approach in terms of analyzing medieval landscapes, but at the same time the nature of this practice leads to its own self-destruction. Its implementation in this territory has been too often aimed at releasing the urbansable areas of administrative impairments linked to heritage issues for the benefit of public or private building promoters. The fate of the findings and the documentation generated through this process has not been a serious concern, even for academic institutions. The human and material limitations, improvidence and inefficiency of the responsible public administration system to properly manage the operation of preventive archaeology in the 17 autonomous regional entities make it impossible to quantify the number of projects carried out or to even locate the sites affected during the last 25 years. We are far away from other European experiences in compiling free-access archives that allow anyone to check what has been done, what remains have been lost, what can be done, what the significance of the findings are, and ultimately, what the usefulness of archaeology today is. The democratization of archaeological practices requires to share knowledge through the creation of international, national or regional information systems which provide easy access and assessment of these data. The project Armenop (Medieval Archaeology in the Northwestern Peninsula) was formed with these premises, aiming to become a point of reference for the analysis of medieval landscapes in the Northwest (http://www.armenop.es/).

The profound effects of the economic crisis that began in 2007 are hindering all these initiatives. Consequences are especially felt in a sector such as the archaeological one, so dependent on construction and public works. At least two thirds of the archaeological companies in Spain have disappeared throughout these years. This figure could be even higher if we take into account the independent, self-employed archaeologists. In addition to the personal drama affecting at least two generations of archaeologists, the loss of professionalism amassed in these last few years will be difficult to replace in a short-term future in case that such a volume of archaeologists was to be required once again. Even more if we consider the way in which the teaching system at the universities has been restructured. However, the main issue is that the shutdown of archaeological companies has caused many projects, reports and articles to remain unfinished forever. There are large scale excavations of which we know little or nothing and their data will probably never see the light. It is as if they never existed.

Another important effect of the crisis is the dramatic decrease in the number of archaeological procedures and the shrinking of their potential goals. Extensive archaeological works similar to those carried out between 1997 and 2007 will hardly be run in the short and medium term. In short, the ideal conditions to implement experimental contexts such as those from previous years appear distant and it is unlikely that they will concur in the future. It is therefore time to do more with less and further develop the existing records from the previous field works. These considerations lead us to a more comprehensive one: the experiences discussed above highlight the relevance of the resignification of current landscapes as a priority in the activity of archaeologists. This may be more important than collecting new evidence.

Spanish laws and cultural heritage management practices are based on the concept of well-delimited and defined sites, especially in the case of monumental and standing evidence. Large preventive projects have shown the ineffectiveness of this approach that causes the oblivion of everything else, from the whole setting to the relations between the parties. The mechanization of the countryside and the capitalistic exploitation are blurring the memories and the surviving traces of historical landscapes in large areas of Iberia. With some exceptions, we have to deal with abandoned sites, relict spaces related to the end of the rural communities and the amnesia of the last inhabitants. As a result, only some landmarks are identifiable and can be translated into well-delimited 'sites' in administrative terms. The encompassing contexts and the real (lived) notion of landscape are lost in this process as a result of the reification of the archaeological record.

Can we protect all the landscapes or a particular landscape as a whole? Where are the limits of the sites in administrative terms? Is it useful, reasonable or desirable to protect everything? How may the re-signifying of entire traditional landscapes be feasible? British planning culture applied to the management of cultural resources is foreign to the normative approach of southern Europe, and this needs to be fully assessed and discussed.

It is obvious that safekeeping and valuing heritage are not objective or aseptic exercises, but that they answer to a more precise, explicit or implicit programmes, which have greater ideological, scientific or political weight. As archaeologists we need to be aware of this. When we give greater priority to the study of archaeological landscapes, one of our objectives should

be to surpass the limits we have inherited, rather than to contribute to reinforce them.

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The rural and suburban landscape of Eio-Iyyuh (Tolmo de Minateda, Hellín, Spain): new methodological approaches to detect and interpret its main generating elements

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Abstract

This study analyses the new ways of territorial occupation that appeared in the suburban and rural landscape of the Visigothic city, *Eio*, later the Islamic *madinat* of *Iyyuh*, located without any break in continuity in the current site of El Tolmo de Minateda (Hellín, Albacete). In order to identify and study the main elements that form this landscape (settlements, architecture, productive activities, funerary areas, hydrography or viability), different sources and innovative techniques are used, such as remote sensing (LiDAR, aerial photography), historical cartography, toponymy, the stratigraphic study of agricultural plots, photogrammetry or geophysical prospecting and land surveying. A multidisciplinary approach is used to provide a better understanding of the diachronic relationship between all its components, while at the same time suggesting and identifying its features and fixation in the different historical periods.

Keywords: *Eio*, *madīnat Iyyuh,* Tolmo de Minateda, Late Antiquity and Early Medieval rural landscape, Late Antique and Early Medieval necropolises

Introduction[1]

The investigation of the history of Late Antiquity and High Middle Ages in the current province of Albacete mainly focuses on the excavations that were carried out in El Tolmo de Minateda[2]. Combined with a wide range of discoveries, these archaeological excavations help to outline an incomplete occupational map. It has been possible to identify El Tolmo with the *Eiotana or Elotana*[2] episcopal see thanks to historical toponymy, which was able to reconstruct, starting with the current toponym Minateda, the evolution of the Latin toponym *Eio* through to its Arabic name (*Iyyuh*), listed in the treaty of Teodomir in the year 713. This episcopal see was founded by the Visigothic Kingdom of Toledo between the end of the 6th century and the beginning of the 7th century, in order to serve as the head of a new bishopric that would manage all the regions belonging to the diocese of *Ilici* (La Alcudia, Elche), that had just been conquered by the Byzantines.

The city was still inhabited after the Muslim conquest at the beginning of the 8th century, and was called *Madīnat Iyyuh*. It became part of a new administrative structure in the southeastern side of *al-Andalus*, known as the *Cora of Tudmīr* (Arabic name of the Visigothic *Dux Theudimer*, who agreed to surrender in the year 713). It was finally abandoned during the second half of the 9th century (Gutiérrez Lloret 1996a and 2014, Abad, Gutiérrez Lloret and Gamo 2000; Gutiérrez Lloret, Abad and Gamo 2005).

Besides the archaeological excavations in the urban centre of El Tolmo, archaeological and geophysical surveys have recently begun in certain sites of its *territorium*. Such excavations are partially documented and classified in the archaeological map of the Hellín (Albacete) region as Late Antique and Early Medieval sites (in particular, the sites of Loma Eugenia in Agra, and Loma Lencina and Alboraj, both in Tobarra).[3] Thanks to these surveys we have been able to specify the chronologies that had been previously suggested, confirming their status as rural settlements ranging from the end of the 6th century to the beginning of the 8th century or, in the case of Alboraj, the end of the 9th century. Depending on the new settlement types in

[1] A systematic project of heritage research and dissemination is being developed in El Tolmo, which is authorized and financed by the Directorate-General for Education, Science and Culture of the Regional Government of Castilla-La Mancha, under the scientific direction of the University of Alicante (Lorenzo Abad, Sonia Gutiérrez Lloret and Pablo Cánovas), and the Museum of Albacete (Blanca Gamo).

[2] The suggested toponymic transmission chain is: *Eio* (Visigothic episcopal see, 7th century) >*MadīnatIyyuh* [*Madinatiya*] (Islamic city, 8th and 9th centuries) >*Medina Tea* (estate in Hellín, 1252) >*Medinatea-Minatea* (inn 1576) >*Minateda* (inn and place, 19th and 20th centuries) (Gutiérrez Lloret 2000; Gutiérrez Lloret, Abad and Gamo 2005; Carmona, 2009).

[3] In these settlements, which had been deserted since the Middle Ages, a few partial excavations were carried out in the 80s and 90s of the 20th century, establishing a provisional chronology contemporary to the Early Medieval contexts of El Tolmo de Minateda (Rico, López Precioso and Gamo 1993; Rico 1996; Jordán 1992; Jordán and González Blanco 1985; Jordán and Matilla 1995; Jordán, Ramallo and Selva 1984).

the highlands (*castral/turres*) and lowlands (villages), it can be argued that the urban centre of El Tolmo de Minateda was the administrative centre in both the Visigothic and Islamic periods.[4]

However, most of the information known to date about these rural centres comes from surface surveys or small excavations that focused on funerary areas. Therefore, this information is still very incomplete and prevents a complete characterization of this region's territorial structure. This is why one of the most important goals in the research agenda of the Tolmo de Minateda project is to retrieve more complex archaeological registries through new non-invasive analysis methodologies and technologies such as remote sensing. These tools give a macro-spatial vision of the territory and explain the *longe durée* transformations of the historical landscapes, especially in the Postclassical era.

Sources and elements of analysis of the postclassical landscape in the territory of *Eio-Iyyuh*

Recent research about the organization of the territory and settlements during the change from Late Antiquity to the Early Middle Ages in the Iberian Peninsula has shown important changes in the structure and management of the rural space. The end of the imperial model is commonly associated with the progressive abandonment of the Roman rural centres par excellence, the *uillae*. Meanwhile, new settlements can be seen in the highland. These were the centres of control and management of the territory (*castra/turres*) near the cities. New types of settlements also appear in the lowlands (villages and scattered habitats).[5] These would sometimes occupy agricultural areas and previous Roman settlements or would settle down in new areas with interesting resources. However, this generic evolution model includes a variety of processes that respond to the historical trajectories, geographical environments or traditional methods of economic exploitation.

In the case of El Tolmo de Minateda, research has mainly focused on the *ciuitas*, unearthing its walls and centre of ideological representation, formed by an episcopal compound that includes church, baptistery and being the *domus episcopi* (Gutiérrez Lloret, Sarabia 2013). The control of the main communication road between the Visigothic royal seat of *Toletum*

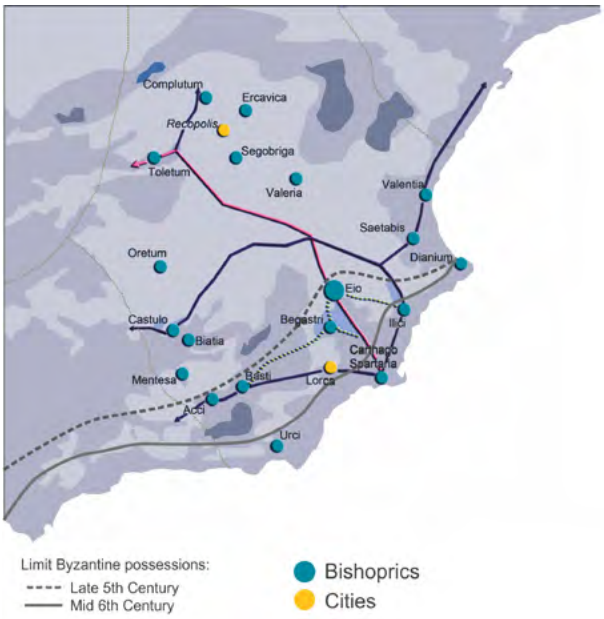

Figure 1. Map of the southeastern side of the Peninsula showing the main bishoprics and Visigothic and Byzantine cities.

(Toledo) and the Byzantine capital *Carthago Spartaria* (Cartagena), would have been key to its revival as an episcopal see intended to manage the territories belonging to the *ilicitana* diocese, gradually added as the Visigoths advanced towards the south-eastern coast of *Carthaginensis* (Abad and Gutiérrez Lloret 1997). We do not know exactly the extension of the territory administered by the new border diocese. However, the distance between other surrounding sees, which are separated by topographic features, would have made the communication difficult.[6] This leads us to believe that this see would control quite a large territory (Figure 1) thanks to its strategic location (Gutiérrez Lloret and Grau 2012, 174).

Therefore, the analysis of how the settlements were structured in this large territory and the possible administrative and religious relationship of the settlements with the Visigothic *ciuitas* is key to knowing the role that this urban centre, which later turned into a *madīna*, played. The first works (Rico, Gamo and López Precioso 1993; Gamo 1998 and 2006) continue with the current investigation of the settlements and surroundings of the site (Gutiérrez Lloret and Grau 2012; Sarabia 2014 and 2015). These new perspectives acknowledge the distinct features of the landscape in the Hellín region in the context of the Early Medieval city (Figure 2). These features are recognized and

[4] Some authors have previously suggested a first characterization of the rural settlement in Hellín. We suggest the creation of new forms of group housing (villages) from the end of the 6th century (Gamo 1998; Gutiérrez Lloret and Grau 2012; Sarabia 2014).

[5] Among others we can cite as more recent proceedings on the territory of the Iberian Peninsula in Late Antique and Early Medieval times: Caballero, Mateos and Cordero 2011; Quirós 2010; Espinosa and Castellanos 2006; Escalona 2008; Escalona and Reynolds 2011; VV.AA. 2012; Fernández Mier *et al.* 2014.

[6] In the north it bordered the sees of *Dianium*, *Saetabis, Valeria* and, perhaps, *Segobriga*, while the west area bordered with *Basti*, and most probably *Biatia, Castulo* and *Oretum*. To the south and southeast with *Begastri, Cartago Spartaria* and *Ilici.*

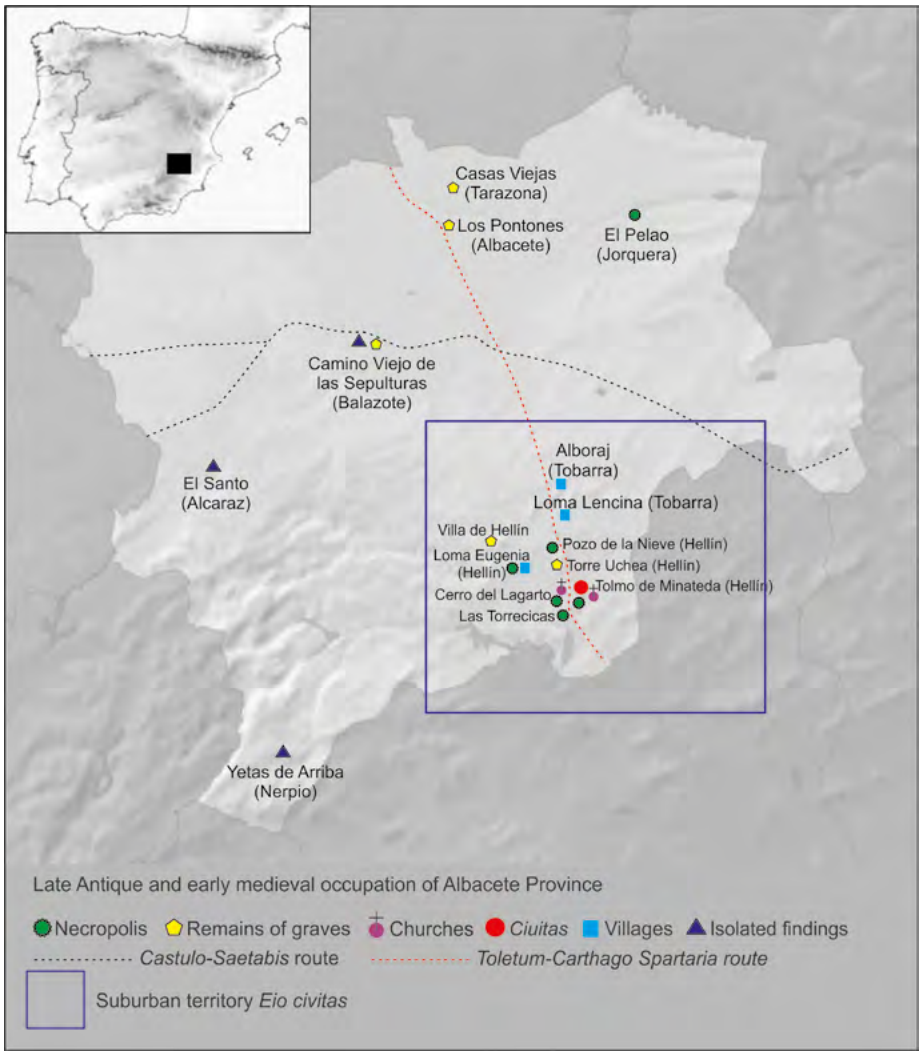

Figure 2. Map of the province of Albacete with the main locations where Late Antique and Early Medieval contexts have been documented.

analysed in a study area of approximately 450 sqm in two different scales:

a) *Micro-spatial Scale* — new typology of rural settlements with agricultural centres (villages or scattered habitats), settlements in the highlands (*castra*, *turres*), and other types (hermitages and cave habitats). The elements are: the architecture (residential, religious and defensive); the productive spaces and the funerary contexts.

b) *Macro-spatial Scale* — environment of the settlements (elements and exploitation of resources/transformation of the landscape): road networks; hydraulic networks (artificial and natural) and water uses; land uses: cultivation areas and fallow (*incultum*) areas (forests, pastures, ponds, etc.)

In order to recognize the main elements created this Late Antique and Early Medieval landscape, we rely on several sources and innovative technologies that will help us understand the relationship between all of its components from a diachronic perspective (Brogiolo *et al.* 2012; Chavarria Arnau and Reynolds 2015). For instance, the use of historical cartography (Brigand 2015), toponymy and new surveying techniques through remote sensing (LIDAR, GPR, radar and aerial photo-interpretation) (Crutchley 2015; Kamermans, Gojda and Posluschny 2014), combined with the planning of field surveys and strategic excavations with specific objectives, allows the study of the evolution of rural landscapes by archaeologically verifying the theoretical frameworks of reference.

This is the framework for a new approach in the research of the Tolmo's landscape that we have started recently. In the following pages we present some evidences extracted from sources and techniques such as historical cartography or remote sensing. This is a preliminary study which wants to show the potential of some of these resources, but be aware that this is still an emerging research. For this reason, such evidences are presented interleaved in different parts of the text and not as a section devoted exclusively to these sources and methodologies.

One of the essential sources is the study of the toponyms found in historical cartography, which in this

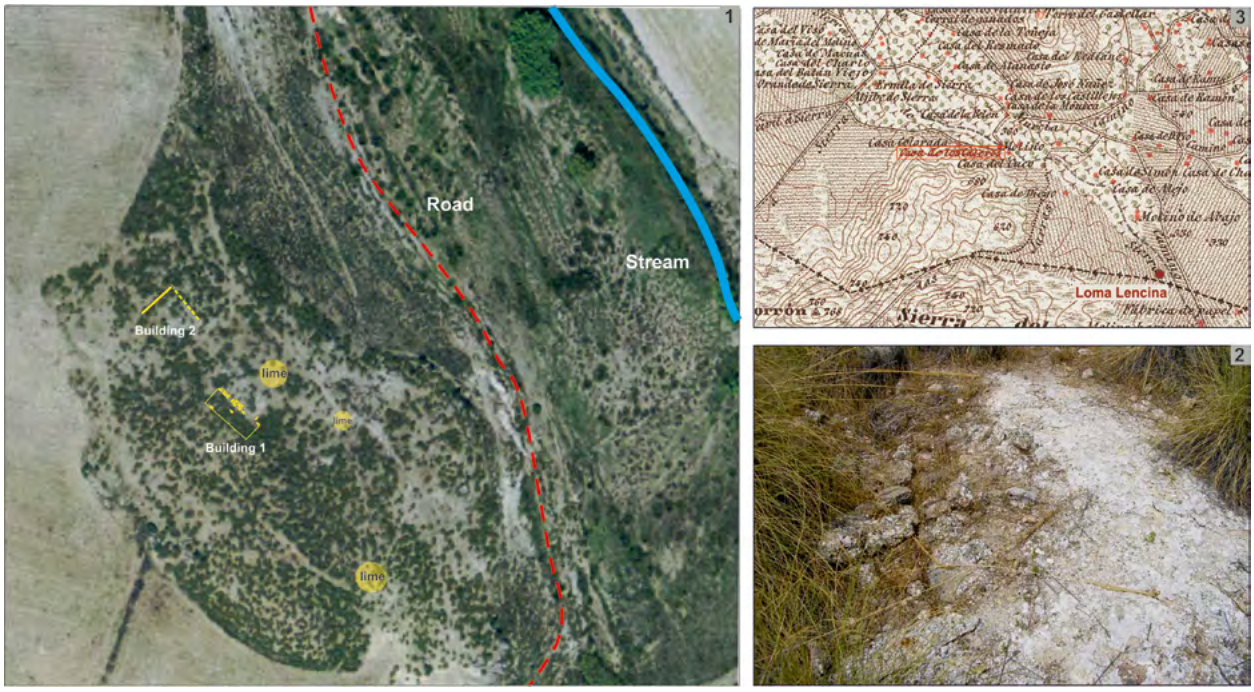

Figure 3. Orthophoto of Loma Lencina that shows the limestone concentration areas and structures on the surface (buildings 1 and 2). To the right, detail of some of the lime deposits (2) and cartography from 1983 with the toponym 'Casa de los Caleros' (House of the lime merchants), a few metres away from Loma Lencina (3).

particular case, refers to the different versions of the National Topographic Map and the cartographic notes[7] before this map's creation. These types of documents were mainly created between 1870 and 1950. Through toponyms, they allow us to locate and interpret some historical resources exploitation activities (for example, quarries or mills). The etymology of many of these toponyms can also indicate the elements that created certain landscapes (hydronyms—names that refer to water bodies and courses; litonyms—names of rock formations; fitotoponyms—names of plant species, etc.) or at what point in time (Latin toponyms, Arabic ones, etc.) (Molina Díaz 2012).

For example, in the site of Loma Lencina (Tobarra), which has only been surveyed on the surface, a set of ceramics was discovered that fits within a very specific chronological phase from the end of the 6th century until the 7th century (Rico 1996; Gamo 1998, 171-175; Gutiérrez Lloret and Grau 2012, 186; Sarabia 2014, 219-220). This coincides with the historical context of the bishopric in *Eio*. To date, this is the only site documented in the Hellín region that clearly appears in an area that was not previously occupied. This may indicate the intention or necessity of exploiting new non-agricultural resources. This, together with the fact that there are large lime piles in the surface levels[8] (Figure 3.1-2), leads us to believe that Loma Lencina was a location that produced this construction material, maybe seasonally, and appeared in the same moment where the episcopal see was being built in El Tolmo.

This hypothesis can be reinforced by information extracted from the cartographic documentation of the end of the 19th century (1893). Here, there is a toponym that refers to a 'House of lime merchants' next to the site. This could suggest that this activity had existed in the area since the Early Middle Ages (Figure 3.3). However, without an excavation of the site, it is difficult to confirm whether it already existed during that period.

The information provided by toponymy, together with parts extracted from other historical sources, such as the itineraries or descriptions of classical and medieval geographers, allows us to know the main and secondary viability in the different historical moments. This is a key element in analysing and locating the landscape built in each context. An essential example for the area

[7] All these cartographic resources can be found in the digital catalogue of the National Geographic Institute (http://www.ign.es/ign/main/index.do).

[8] Even though some authors suggest that these lime piles could correspond to the destruction levels of the claddings and roofs of domestic structures (Rico 1996, 286), the large lime concentrations and existence of circular stone structures suggest these were the traditional lime furnaces or limekilns (Bianchi 2011). Furthermore, from a lithological point of view, the area is made up of limestone outcrops that date from the Cretacic period, bordering an area highly eroded by water, which would provide the necessary rocks for this activity.

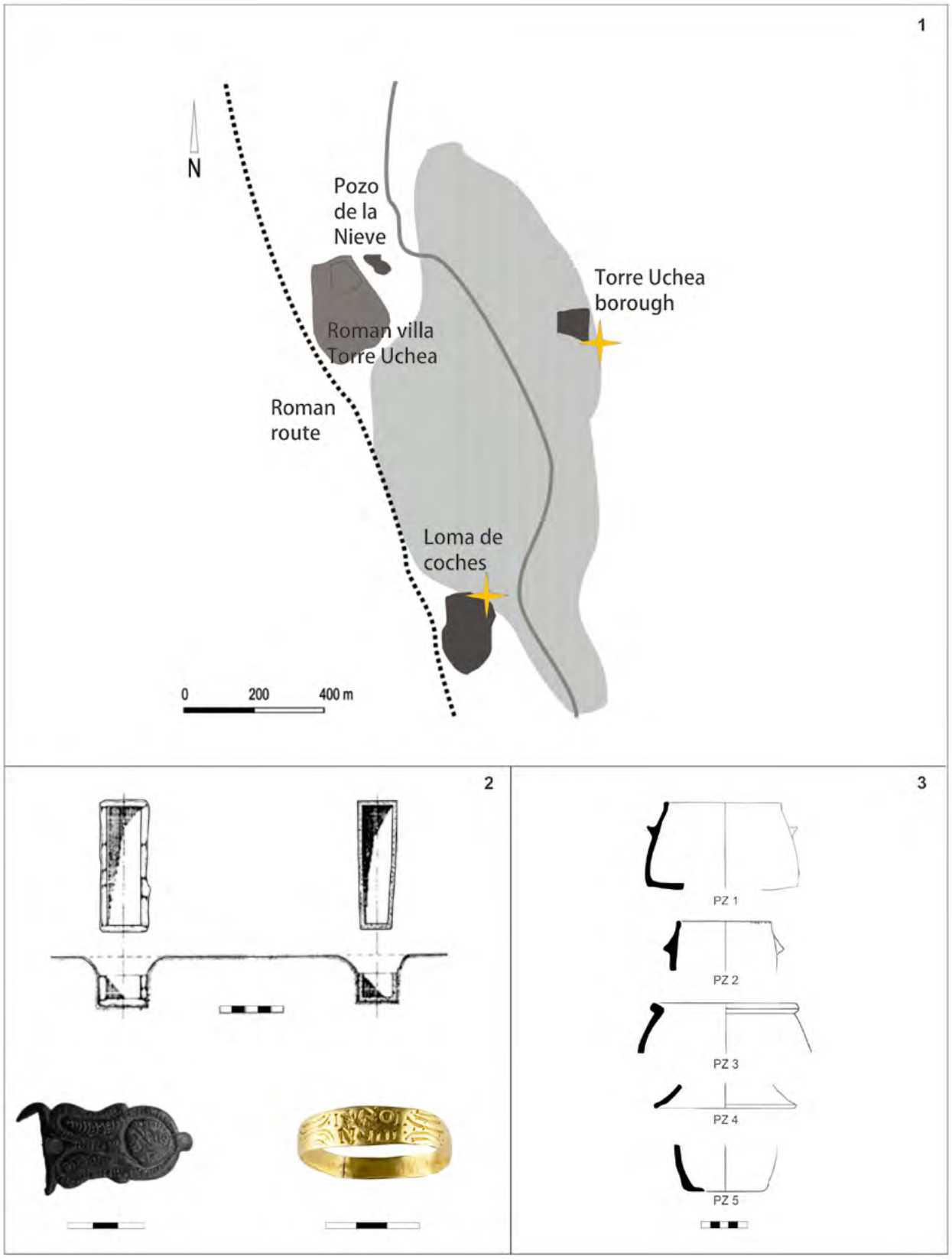

Figure 4. Distribution of the different occupations documented in the area of Torre Uchea from the Roman period until the Early Middle Ages, and of the materials discovered in the funerary contexts and silos (images published in: Gamo 1998, 175-179, lám. 43; Gutiérrez Lloret and Grau 2012, figs. 6 and 7; Sarabia 2014, fig. 3).

of our study can be found in ʿal-*'Uḏrī*, a geographer from Almeria that made a detailed description of the *Cora of Tudmir*[9] where he mentions some of the main itineraries, which is proof of the continuity of traditional roads and, therefore, the development of habitats in their surroundings. In the case of El Tolmo, one of the fundamental roads was the old Roman road that connected *Complutum* (Alcalá de Henáres, Madrid) with *Carthago Noua* (Cartagena, Murcia), the centre of the peninsula with the eastern coast (Sillières 1990). During the High Middle Ages, this connected the capital of the Visigothic kingdom, *Toletum*, with the Byzantine one, *Carthago Spartaria* (name that refers to Cartagena in later sources), and, after the 9th century, the *madīna* of *Ṭulayṭula* with Murcia, the region's new capital. The fact that the historical itineraries were kept is also reflected in the topographic locations of the settlements, which are stable and durable in most of those areas. They also show the morphologies of each cultural context. This is what happened in the surroundings of the current district of Torre Uchea (Figure 4), north of El Tolmo. This is the best example of the ongoing occupation of an area very near to the aforementioned main road with exceptional agricultural features. There is evidence that suggests the area has been inhabited since the Iberian period, though in different locations (López Precioso 1995; Gamo 1998, 175-177; Gutiérrez Lloret and Grau 2012, 181; Sarabia 2014, 217-219).

Another novel method for the study of historical landscapes is remote sensing, especially LiDAR (*Light Detection And Ranging*) exploration (Crutchley 2010) and geophysical surveys (GPR or Ground Penetrating Radar). Thanks to these, we can recognize the evolution suffered by agricultural systems, the viability or the hydrology, through the regressive study of the documentation, as well as historical cartography and aerial photography. Besides, both traditional cartographic maps and Digital Terrain Models can be used to define certain topographic anomalies related to the morphology of the landscape in a specific historical context (Chadwick 2008). They also help to detect old abandoned agricultural systems such as farming terraces on the hillsides, or visualize old riverbeds or paleoriverbeds that have transformed their courses and do not correspond to the current ones, while the old ones may have generated nearby settlements (Cavalli and Tarolli 2011). Gerard Chouquer (2000) classified agricultural divisions into two large categories: those that are planned, with coherent orientation and regularity of measures, and those that were created as the result of adapting to the landscape and the so-called generating elements. This way, historiography usually assumes that a system of land divided into plots with a centripetal morphology can be frequently related to settlements that were created in the protohistoric or medieval period. Meanwhile, a more orthogonal occupation is typically attributed to settlements that appeared in the classical period (Chouquer 2010).

An example of the detection of landscape anomalies through LiDAR[10] can be seen in the surroundings of the Visigothic village, Loma Eugenia (Hellín).[11] Here, the morphology of the agricultural landscape that we find around the settlement shows the same orientation as the main water course of the area (the ravine of Cañada de Agra), which is 300 m away from the village, as well as the viability associated with this agricultural space. Therefore, it seems that these systems are not generated from the habitat locations, but rather according to the hydric element.

This could mean two things: a) that it is a more modern agricultural system and not directly related to the Early Medieval village; b) that it was generated at the same time as the village or in a previous era, but according to the water courses. The latter is more likely, if we take into account that the old Roman villa of Agra (Fuster 1988; Jordán and Matilla 1995; Gamo 1998; Sanz 2001-2001), which is located about 600 m northeast of the hill, also shows an agricultural system of plots that are orientated according to the ravine. Therefore, it seems that the choice of this hill as the location of the Visigothic village was encouraged by the existence of a favourable agricultural environment. This had already been exploited since, at least, the Early Empire period by the owners of the old villa, and was created according to the water course (Figure 5). Other information extracted from the LiDAR in the area of Loma Eugenia is the detection of several abandoned terraces, which cannot be seen from the current orthophoto (Figure 5 5, LU1).[12] This is because some of the plots they are in have a different orientation and, possibly, also a different use. Meanwhile, the current lands have arable crops and non-citrus fruit trees (SIOSE coverage).

[9] 'Al-'Uḏrī, *Al-masâlikilâgamî'al-mamâlik*, Edition Al-Ahwānī (1965) and translated by Molina López (1972).

[10] The point clouds have been captured by the National Geographic Institute with LiDAR sensor with a density of 0,5 points/m2, generating a file with LAZ extension that has been used in the Global Mapper software to create the DTM shown (Geodetic Reference System ETRS89), (website for downloading in the IGN: http://centrodedescargas.cnig.es/CentroDescargas/buscadorCatalogo.do?codFamilia=LIDAR).

[11] The chronologies of Loma Eugenia are the same as in Loma Lencina. Ceramic materials have been found on the surface, which establishes a provisional chronology around the end of the 6th and beginning of the 7th and 8th centuries. In the partial excavation of the northern necropolis of the site, some personal adornment items were also discovered – lyriform belt plaques assigned to the Level V of Ripoll (600-711 AD) (Ripoll 1998, 69) (Rico, López Precioso and Gamo 1993; Gamo 1998, 165-171; Gutiérrez Lloret and Grau 2012, 186; Sarabia 2014, 221-223).

[12] The LU (Landscape Units) have a homogeneous orientation, sequence and morphology of the plots (concentric shape, orthogonal, oriented according to a water course or road, etc.), which can suggest the unitary creation of that landscape in a specific moment (Brogiolo *et al.* 2012).

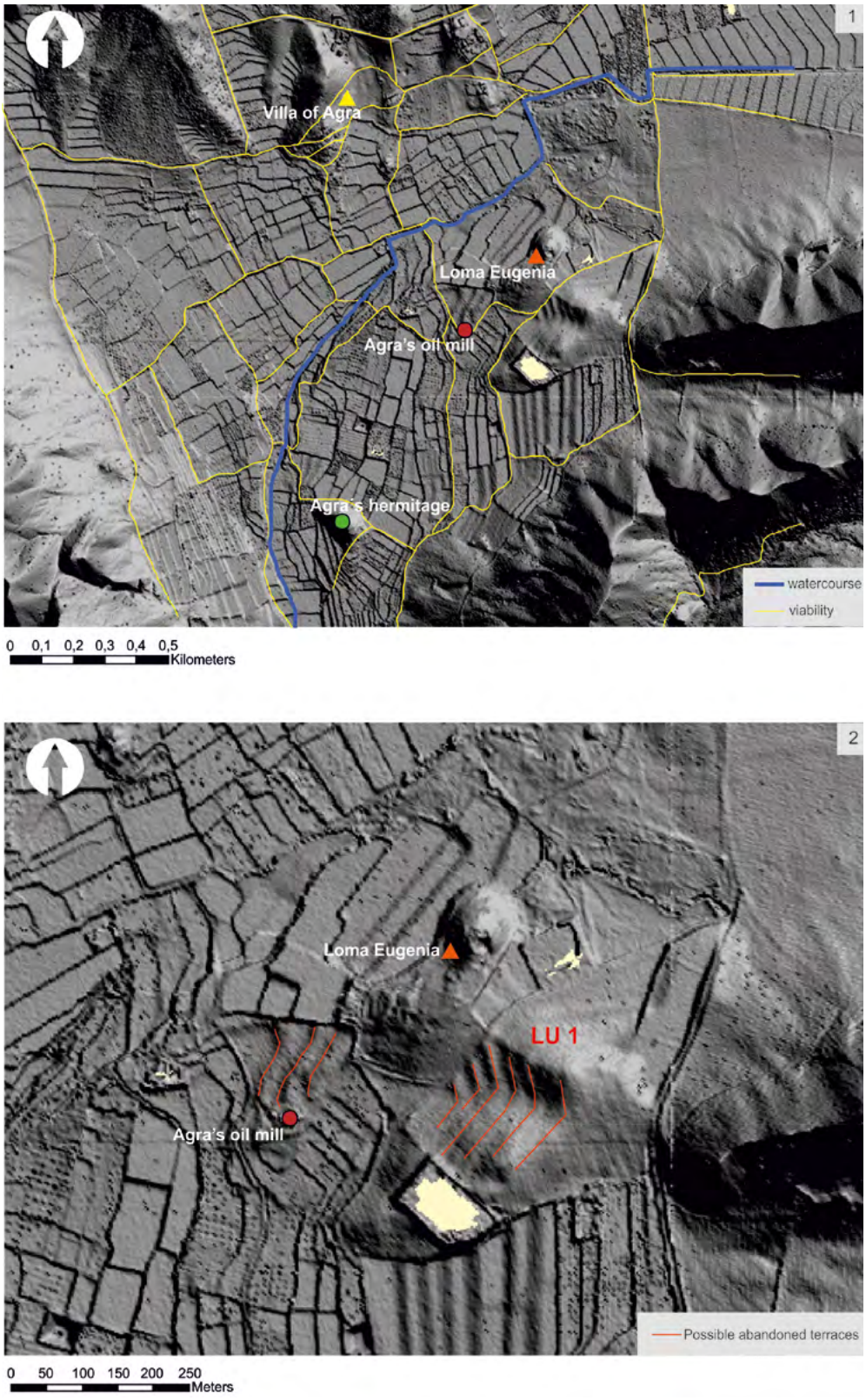

Figure 5. LiDAR images of the area in Loma Eugenia (Agra, Hellín). The top picture shows the orientation of the land divided into plots and minor viability around the Agra ravine. The bottom picture gives the detail of the anomalies detected south of the hill, with already abandoned farming terraces (LP1).

These fossil terraces could have been a part of the agricultural space that was contemporary to the Early Medieval village. However, without an excavation and an archaeobotanical analysis of sediments of these fossil terraces we cannot establish the chronology or historical land uses. According to the cartography of 1935, they were already abandoned, since the uses of the land coincided with the current ones.

All of these sources and methods of analysis of the historical landscapes, to which we have to add recent surveys on the field, have helped create new material

registries that confirm certain aspects of a first characterization of the settlement and the Late Antique and Early Medieval rural landscape in the region of Hellín (Gutiérrez Lloret and Grau 2012; Sarabia 2014), which had been previously suggested by other authors (Gamo 1998).

Typology of the habitat and the main elements that describe the rural and suburban landscape of *Eio*

The characterization of these places helps us understand the transformations suffered by the economic models in this area, especially throughout the 5th century AD. For example, we can suggest that, between the end of the 6th and beginning of the 7th century AD, there was a fairly large (about 6000 sqm of surface) peasant village in Loma Eugenia (Hellín). This village could have been physically dependent of the city of *Eio*, which had its moment of splendour. The peasant village would have been a part of another network of rural centres (Loma Lencina, in Tobarra) that appear in that same time period. This would suggest the exploitation of new lands and other resources near the *ciuitas*, such as the aforementioned lime production.

It is worth highlighting that many of the settlements that appeared in the rural landscape of El Tolmo during the re-foundation of the city (c. 600 AD) were be located near old Roman stately establishments (especially *uillae*). It is possible that they maintained the agricultural space. However, they would have a new strategy for space occupation. This phenomenon could have meant the continuity of old stately properties, though with a change in the management of the land. This would imply a topographic movement of the habitat assigned to those properties. In some cases, as in Torre Uchea (Hellín), old funerary areas were kept but it seems that settlements were not (Figure 4).

As already mentioned, the analysis of these territorial processes has only used the data provided by the remote survey and surface inspection works of a study area of approximately 450 sqm. Consequently, the information that we currently have is still too partial, since studies have mostly focused on the 'archaeological site'. These are specific areas where most of the materials have been discovered, identifying them as living areas. However, settlements are not isolated landmarks in the landscape, they are areas where human action is most visible due to the remodelling of the plot and construction of buildings and work places, as well as burial or cult areas. Other anthropic activities took place in the landscape. These remains can also be seen in the archaeological registry as agricultural work (using land and water), movement (viability) or *incultum* (use of non-agricultural areas).

Micro-spatial scale: settlements

Thanks to the archaeological recognition of detected habitats, we can establish, at least for the suburban area of the Visigothic city, a first typology of settlements related to two main settlement structures. These are the *castra* or *turres*, which are dense and fortified settlements located in high places, and the agricultural model of aggregated villages or towns, which could appear next to old Late Antique villas.

Domestic, defensive and religious architecture

Focusing on the main features of these new settlements, on the architecture found in places, such as Loma Eugenia and Loma Lencina, the area of these villages seems no bigger than 6000 sqm. Furthermore, even though domestic units have not yet been unearthed, masonry bases with vertical doorjambs that are similar to the Early Medieval domestic structures found in El Tolmo can be seen on the surface (Gutiérrez Lloret and Grau 2012, 184; Gutiérrez Lloret and Cañavate 2010; Sarabia 2014). In the case of Loma Eugenia, a recent electromagnetic survey with the Ground Penetrating Radar technique (GPR)[13] was conducted to verify the existence of buried structures and, therefore, establish the possible size and distribution of the settlement. According to the anomalies detected through LiDAR and the structures that appear on the surface, two areas were selected (Figure 6). A total of 57 CT scans or GPR profiles were obtained, 37 in the so-called area 1 (central part of the hill) and another 20 in area 2 (southwestern sector).[14] The interpretation of the resulting radargrams consists of fixing a position and extension for all of the anomalies observed on each individual profile, followed by its possible classification in a four-level scale (Pueyo *et al.* 2005).

Next, the position and length of each anomaly are translated to a planimetry in order to value its lateral continuity according to the outline of the profiles. Inside the scale of degrees of identification of the aforementioned archaeological remains (*ibidem*), those in Loma Eugenia would mostly be hyperbolic anomalies of level 2. This level represents archaeological remains that cannot be directly seen on the surface but have been located in all of the profiles made and have lateral continuity. In this survey's resulting cartography, we appreciate how the anomalies have mostly lateral continuity and are NW-SE oriented, and others aligned to NE-SW. All of them appear at 20-40 cm of depth and

[13] Procedure carried out by the team in the department of Earth and Environmental Science in the University of Alicante, directed by José Juan Giner Caturla.

[14] GPR anomalies are associated with a contrast of properties that appear in the registry as unique hyperbolic shapes. The size and position of an anomaly suggests the form and position of the contrast that produces it. Once filtered, 2D images of the profiles (radargram) are obtained.

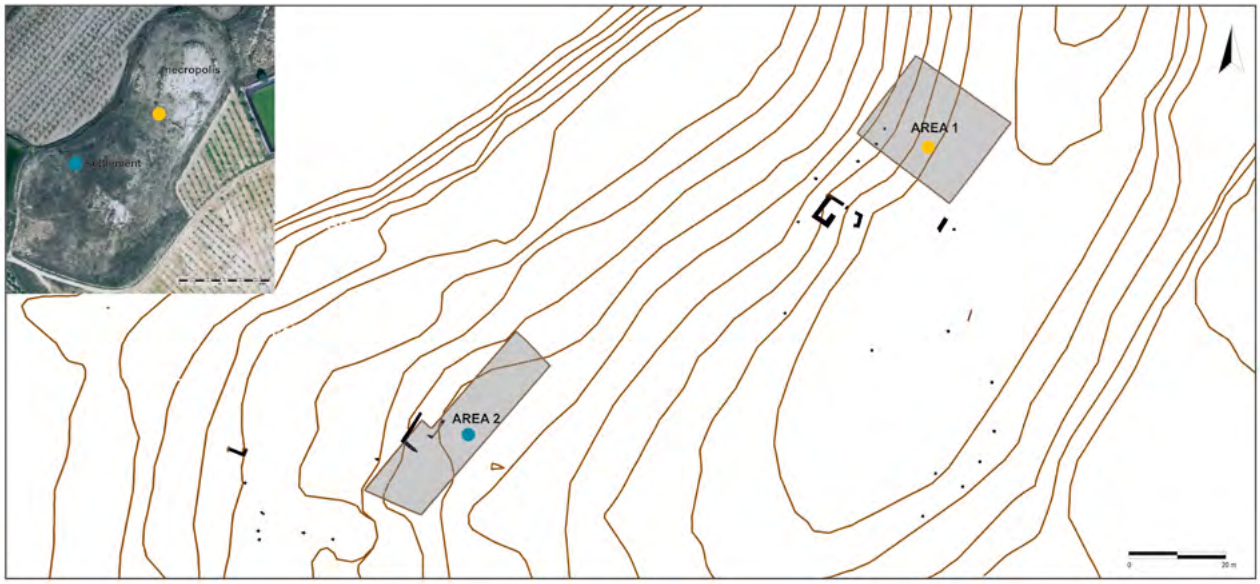

Figure 6. Location of the areas chosen for the GPR surveys in Loma Eugenia.

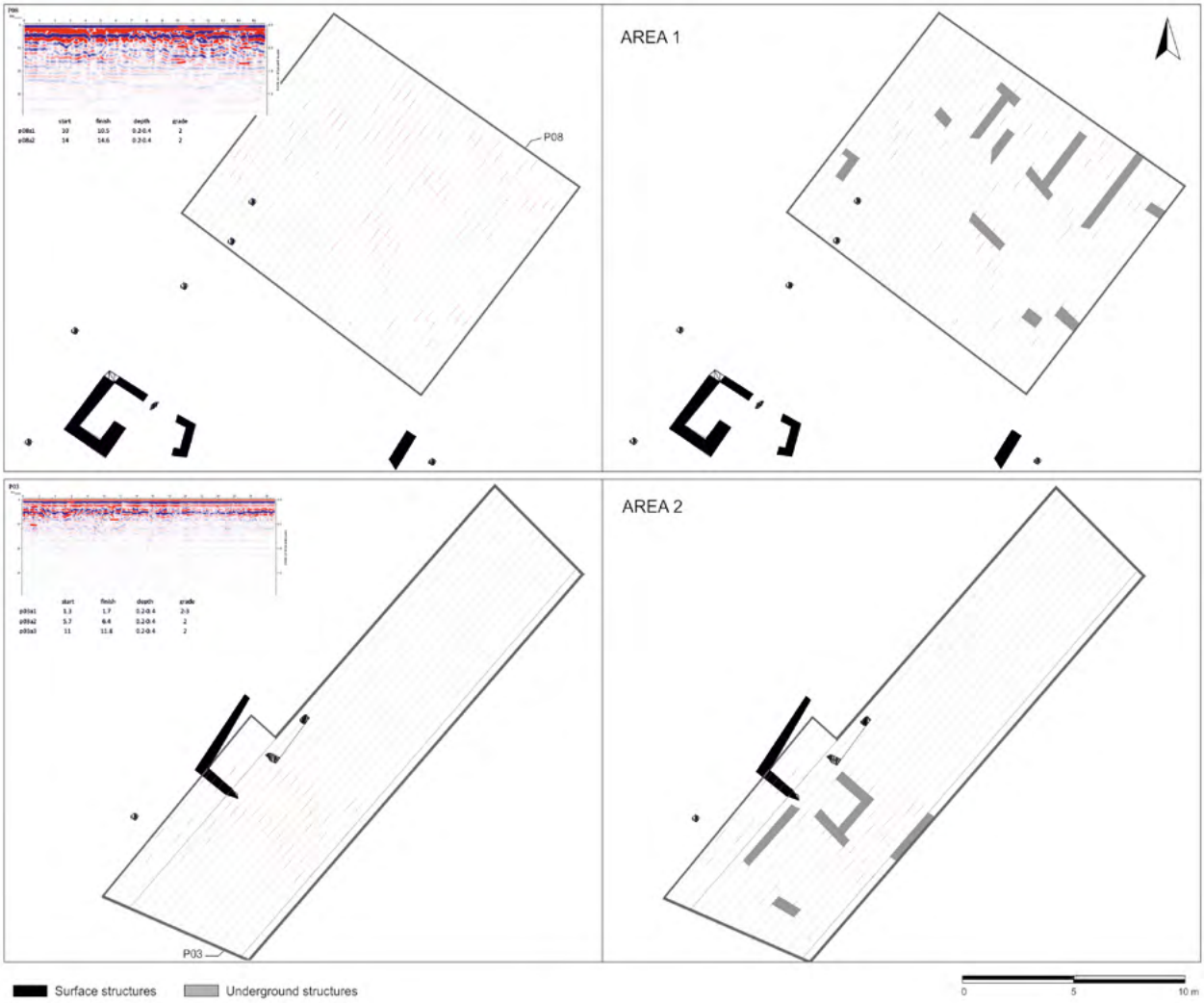

Figure 7. Detail of two radargrams belonging to the profile 08 of the area 1, and the profile 03 of the area 2. We can see the beginning and end of the anomalies, their depth and their degree of being an archaeological remain. To the right, we see the planimetry with the structural interpretation of the different anomalies detected.

Figure 8. Orthophoto of Alboraj with the distribution of the structures documented on the surface during the survey of the area. To the right, a view of the gate with the access opening flanked by two large jambs carved in the rock and remains of a carriage trace in front of it. Below, an image of the eastern wall from the 10 x 7 m large building discovered in the southern area of the hill's surface.

are about 40-60 cm long. These parameters suggest that they could be walls of rooms (Figure 7). In the case of area 2, these structures seem to be a part of a room that can be seen on the surface. This room has masonry walls with blocks that are bigger on the corners and openings. The other anomalies, those without lateral continuity or longitudinal alignment, could belong to isolated stones, pits or other types of non-linear structural elements such as fireplaces.

On a preliminary basis, we can suggest the existence of a village formed by architectural environments of 5 m length and 3 m wide, with a northwestern-southeastern orientation expanding from the western hillside to the centre-northern side. This expansion would probably continue until the sector of the necropolis was reached, located at the northern side of the site. In the 'area 2', the rooms have a terraced arrangement, suggesting a certain structural organization.

Even though we still do not have enough information to know how the domestic units were defined in these villages, according to the documentation of the Early Medieval contexts in El Tolmo de Minateda, an original single unit could have evolved into more complex structures by adding rooms around a courtyard (Gutiérrez Lloret 2012). This would have solved the families' need for space, as has been interpreted in some of the rural Visigothic settlements in the southern area of Madrid, such as Gózquez (San Martín de la Vega) (Vigil-Escalera 2009) or La Vega (Boadilla del Monte) (Alfaro and Martín 2006).

Next to these open village communities in the rural areas of the new diocese of *Eio*, there is an increasing amount of information that refers to other type of establishments that are different to villages. These could correspond to certain settlements located in high places (*turres* o *castra*) that, together with the *ciuitates*, would become the new central places for the administrative control and fiscal management of the territory (Chavarría 2013, 157; Martín Viso 2006). This type of settlement could be suggested for Torre Uchea and, in particular, the hill of Alboraj, whose Arabic toponym does in fact mean 'the tower.'[15] Following a recent survey in the area, a type of architecture that is different to the one in the open villages has been documented (Sarabia 2014, 223-226). Similar to El Tolmo, it is located on a hill about 650 m high, with steep slopes that act as a natural defence. However, on the top part there are some large collapsed stones that could indicate the existence of a wall on some sections of the perimeter. On the eastern side of a central riverbed that crosses the site, we have located a threshold, which is flanked by two large doorjambs carved in stone. In front of these are carriage traces, which mark the access road to the settlement (Figure 8).

On the top platform, there are two quadrangular structures. The south one is about 10 x 7 m, with perimetral walls that alternate external wall coverings of large stone slabs with medium-size stone fillings

[15] Contrary to what happens in the aforementioned 'village' settlements, where there have been no materials documented after the 8th century, in Alboraj there seems to be a continuity of the occupation until the end of the 9th century, similar to what happened in the episcopal see of El Tolmo, which had already turned into an Islamic city. This reinforces its interpretation as *castrum* or *turris*, since the role played by the *ciuitates* and *castra* in the organization and fiscal control of the territory during the Visigothic period continued until the Islamic 'castral districts' were developed at the beginning of the 10th century. This is when the new Islamic organizational and territorial exploitation patterns seem to reach their peak (Gutiérrez Lloret 1996a, 2014 and 2015).

Figure 9. Aerial view of the ciuitas of Eio and the two suburban hills of Cerro del Lagarto and Las Torrecicas.

thickened with mortar. On the northern part, there is a large enclosure that could belong to a tower. This can be easily seen in the aerial photograph.

Even though we currently only have surface information, there are certain elements that make it different from the other sites that are documented in the suburban territory of this diocese. This suggests the existence of one of these settlements located on a high area, with a prestigious architecture that is possibly fortified. The fact that the site is next to the same road network that connects the Visigothic city to the centre of the Peninsula and the coast confirms that this place had a strategic function that offered control, power and fast access to the capital of the diocese. This fact, together with it possibly being a military settlement (large quadrangular buildings, natural defence, gate, etc.), could suggest a defensive function. This hypothesis is made in the historical context of the creation of the bishopric of *Eio* in the southeastern *limes* of the Visigothic kingdom of Toledo. This explains the creation of a military structure for the defence and control of the territory against the Byzantines by the second half of the 6th century. In fact, there is archaeological evidences the Visigoth king Leovigildo attempt to control neighboring territories in the *limes* (see *castrum* of 'Valencia la Vella') and consolidate his possessions in the southeast peninsula against the imperial advance (Rosselló 2000). An attempt to take the Visigoth State to establish certain strategic locations in different parts of the border with the byzantine province or *Provincia Spaniae*, such as the bishoprics of *Eio* and *Begastri*, or the mentioned *castrum* of Alboraj (Sarabia 2013, 149).

Regarding religious architecture, until now no rural churches have been detected in the villages or settlements in the highlands. Only rock hermitages from the Visigothic period, like the Camareta cave, which was still in use during the Islamic period. This cave has four rooms where many remains of Latin and Arabic epigraphy have been discovered. The Latin remains are Christian and bear witness to the worship of martyrs, with repeated references such as *Vivas in Cristo* (González Blanco 1993). There seems to be a small non-urban church located in Cerro del Lagarto and related to the suburban area of the *ciuitas* of *Eio*, separated from the city by the Tobarra stream (Breuil and Lantier 1945, 224; López Precioso 1993, 106). Around the partially documented structure and the Las Torrecicas hill in the south, there seems to be a

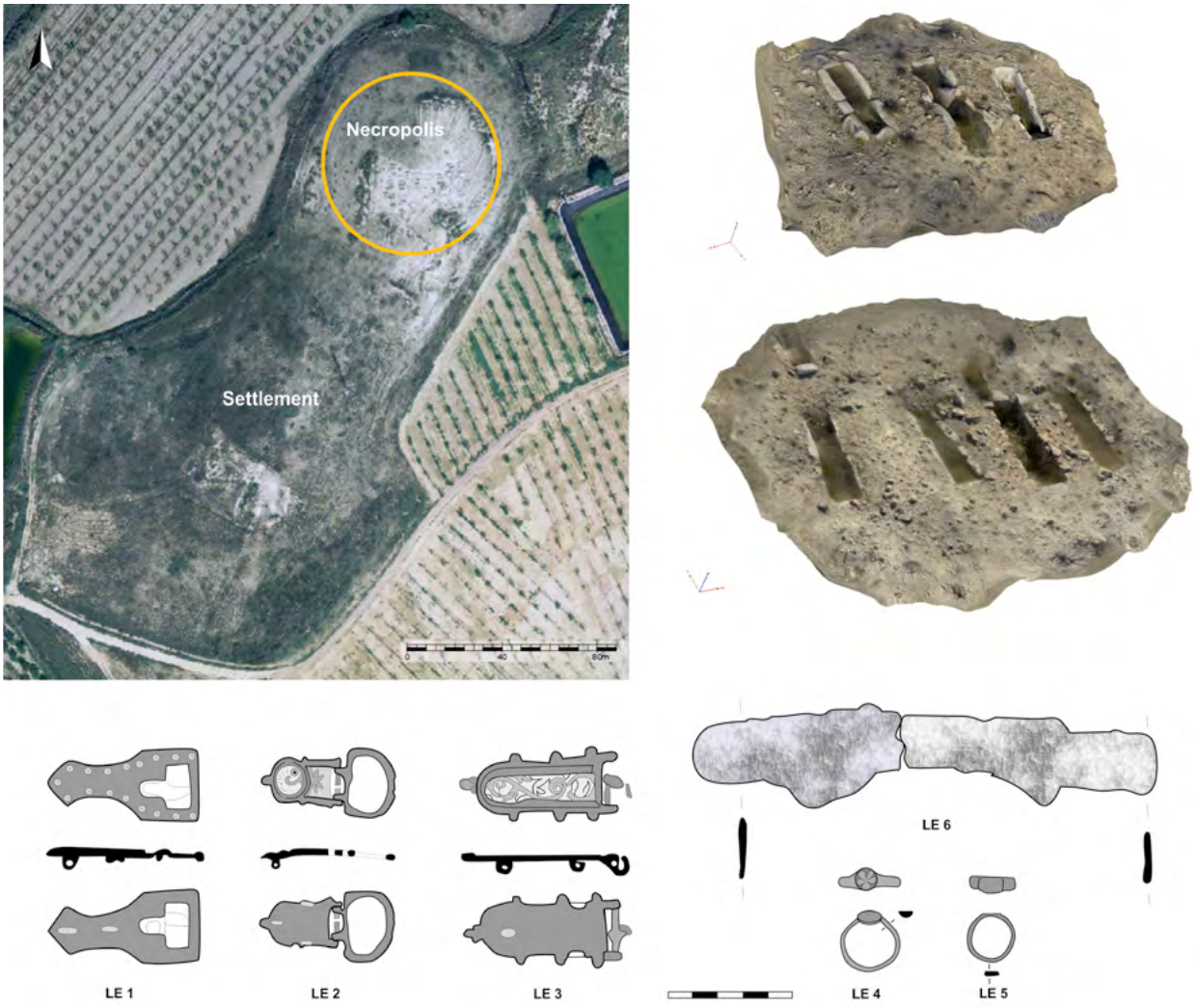

Figure 10. Orthophoto of the village in Loma Eugenia with detail of some graves in the Visigothic necropolis located in the northern area of the hill. Photogrammetry with the typology of the graves and design of the grave goods discovered in some of them (photogrammetry by J. Muñoz, V. Cañavate and J. Sarabia. Grave goods published by: Rico, López Precioso, Gamo 1993; Gamo 1998, 162-164).

burial area with graves excavated in the rock (mostly plundered) (Figure 9). This evidence and the small size of the hypothetical building of cult could mean that it was a funerary church. Alternatively, is the case in cities without tombs of martyrs, it could be a church that was built *ex profeso* next to the access to the city, whose relics generated a burial area *ad sanctos*. However, at the moment we do not have enough archaeological data in order to confirm it.

Productive spaces

The productive spaces are another feature typical of the rural Late Antique and Early Medieval landscape in El Tolmo. Even though most villages are still located in the same geographic spaces, there are a few examples of the occupation of certain areas that were previously marginalized. This is the case for the village in Loma Lencina, north of the Torre Uchea compound, for the moment, the only settlement located in the surroundings of El Tolmo that clearly appears in an area that had not been previously occupied. The structural evidences documented on the site suggest the exploitation of new non-agricultural resources, which possibly had something to do with lime production.

The construction of silos and storage facilities is a key to understanding the impact of the assumed local aristocracy on the rural landscape of the territory of *Eio*, especially in the settlements located in high places (*turres* o *castra*).[16] We do not know if these new stately residences were connected to one or several peasant settlements, or if their function was to acquire their surplus and channel them towards El Tolmo. However, it is possible that they acted as small centres for tax collection, redistribution and rural markets in the territories of the diocese (*central*

[16] Regarding agricultural storage structures in rural Early Medieval landscapes, see Vigil-Escalera, Bianchi and Quirós 2013.

places). In one of these probable stately settlements, in Torre Uchea, some silos or deposits filled with ceramics from the Visigothic period were discovered in the area known as 'El Pozo de la Nieve'. Here, there had previously been an Iberian and early Roman necropolis, with evidence of occasional use during the late Roman or Visigothic period (López Precioso 1995; Gamo 1998, 175-177) (Figure 4).

Funerary contexts

One last typical feature of some of these settlements in the territory of *Eio* is the burial areas. Precisely, in the case of Torre Uchea, Late Antique discoveries seem to concentrate on the top of a hill (Bancal Grande), which dominates the surroundings. There is evidence of a burial area for the rural elites, as proved by some monolithic sarcophagi and personal adornments such as a golden ring with a Christian inscription (Velázquez 1988, 315-319; Selva and Martínez 1991, 119; Gamo 1998, 177-179). The continued use of the burial areas indicates that the old aristocracies had a slight obsession with the 'property of the land'. This happens in Torre Uchea, where the funerary use does not stop from Protohistory until the Early Middle Ages (Sarabia 2015), although, possibly, with a new concept of the aristocratic residence and management of the land, implying movement of the habitat.

Regarding the villages, there are cases where burials have been discovered next to the living areas. This indicates that communities wanted to create stable and multigenerational necropolises (Gutiérrez Lloret and Grau 2012, 191-192; Sarabia 2014, 221 and 2015, 73-75), as seen in other areas of the Peninsula such as the north of Toledo, the Basque Country, the central plain of Castilla or Catalonia (Vigil-Escalera 2007; Quirós 2009; Roig 2009). Those that have been largely excavated show the association between the residential and funerary areas, usually with a communal necropolis that would have been in use during the whole occupation period or, in other cases, with successive ones. In the village of Loma Eugenia, the cemetery is located near the residential area, on the northeastern flank of the hill. It is formed by a series of burials with a western-eastern orientation, which are contemporary to the habitat. In 90s, this necropolis underwent an urgent excavation that exhumed 33 graves excavated in the ground, cladded and covered with slabs, and, in some cases, with a masonry structure to join the slabs and standardize the graves (Figure 10). We cannot establish the exact amount of people discovered in each grave but it seems that they were mostly collective burials. Among the grave goods, two bronze rings, an iron billhook and three belt clips[17] (a rigid one and two lyriform articulated ones, dating respectively from the end of the 6th century and the middle of the 7th century) were found.

This necropolis was only partially excavated but, according to the visible remains, it would expand until the outer limits of the hill, comprising a burial area of about 3000 sqm. If we take into account that the excavated sector has a surface of about 1000 sqm, the necropolis could host a hundred graves, possibly reused at some points in time. This would have been a medium-sized rural community with only one necropolis, at far as we know.

Macro-spatial scale: environment of the settlements

Road networks

Focusing on the analysis of the viability as an element inside the landscape, we appreciate a clear distribution of the Late Antique and Early Medieval settlement all over the old Roman road structure. This was kept in use by connecting Toledo and Cartagena, as proven by cartographic, literary and archaeological sources. Their continuity eased the communication between the rural settlements in the surroundings. It also reinforced the role that the *ciuitas* de *Eio-Iyyuh* in El Tolmo de Minateda had as an administrative centre over its nearby *territorium*.

Contrary to the village in Loma Eugenia, which is located next to a secondary road,[18] the pattern detected in the possible *castra* or *turres* (Torre Uchea, Alboraj) sets them next to the main road, as is the case of the *ciuitas*. This could confirm the role of these settlements located in high places in the territory of *Eio* as central places, with the strategic function of controlling the road and direct communication with the capital of the diocese (Figure 11.1).

In the case of Loma Lencina, whose morphology would correspond more to an open village or seasonal settlement, Pierre Sillières (1982, 254 and 255) describes carriage traces near the well-known Venta del Vidrio. These were found over a road that runs next to the Early Medieval village and the Sierra ravine, which flows south into the Tobarra river. According to Javier López Precioso, 'the main road should go from Venta del Vidrio towards Cordovilla, heading north-northwest through the Camino Viejo de Alborajico, near Alboraj, going into the national

[17] The excavation was directed by Mª Teresa Rico and remains currently unpublished, except for some metallic objects from the grave goods that have been published by Blanca Gamo. The belt clips from the belt LE1 and 2 come respectively from the graves 6 and 25, while the belt clip LE3 is not specified; the ring LE4 and a glass bead come from the grave 27; the ring LE5 appeared in the grave 5, and the billhook in the grave 9 (Gamo 1998, 162-164; Gutiérrez Lloret and Grau 2012, 187, fig. 9; Sarabia 2014, 222).

[18] The secondary road 3.4 of J. López Precioso from El Tolmo de Minateda to La Puerta del Segura (1993, 120-122).

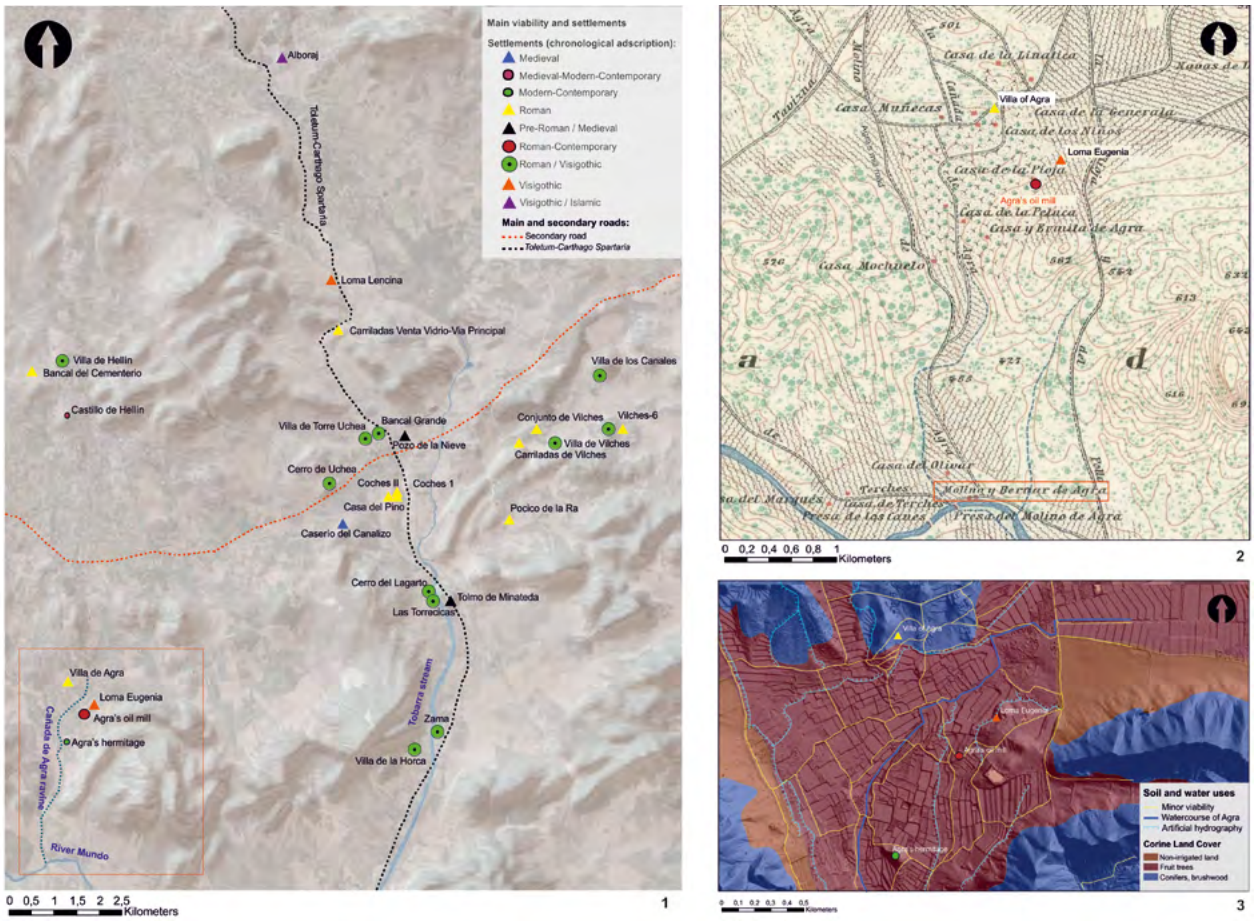

Figure 11. Geographical Information System with the main sites in the area of Hellín that appear in the Catalogue of Protected Goods and Areas of Hellín. In this platform, we see their position with regard to the main and secondary viabilities (1-3), to the hydric resources (1-2) and the land uses (3). In image number two, we see detail of the cartography from the region of Agra from 1935, with some examples of watermills that generate the landscape.

road until Chinchilla' (López Precioso 1993, 116). The fact that this open settlement is located near the main communication road has not so much to do with its strategic role but rather with the limestone production. As such, it needed to be in the proximity of water sources and have easy access to the *ciuitas* and other areas with great construction activity during the 7th century.

Regarding minor viability, when we explained the elements that generated the agricultural landscape in Loma Eugenia, we already mentioned that the agricultural system of land divided into plots. Furthermore, the associated viability to the landscape and hill is articulated and oriented around the main water resource in the area. In this case, it was the 'Cañada de Agra' ravine. Once again, this confirms the role played by the exploitation of natural resources in the development of an agricultural based economy, typical of the peasant societies living in such villages.

Hydraulic network (artificial and natural) and water uses

In the territory of the *ciuitas* of *Eio*, both the new villages that appeared in small hills and those in the highlands would have been located next to a water course (ravine, river, lagoon, spring). This was the real element that generated the landscape. Therefore, the main use of water in the Late Antiquity and the Early Middle Ages was connected to agricultural exploitation. As has been documented in the *ciuitas*, water distribution works (irrigation systems) and storage structures (cisterns, wells) would have been made for the intensive agricultural systems. These structures, as well as the possible pastures created around lagoons such as the one in Alboraj, could have also been used for cattle breeding (Villar 2013).

Water had other uses. It is likely that these uses were fossilized in the toponyms found in the historical cartography around the Early Medieval settlements. For example, producing flour in watermills[19] or in oil

[19] For example, near Loma Eugenia is Molino de Agra (Agra's Mill), on

presses/mills, which required large quantities of water. This can be seen in El Tolmo de Minateda, where there are several examples of rock oil mills (some of them belonging to Early Medieval contexts, such as the oil mill from C-60) with water deposits and oil settling tanks (Gutiérrez 1996b). Both water and oil mills appear in the Catalogue of Protected Goods and Areas of Hellín (CAT 2010) as modern and contemporary. However, the fact that some of these structures created fixed toponyms in the landscape (for example, 'Camino del Molino de Agra', which stands for 'Agra's Mill Road') suggests their possible use in different historical periods, even though the structures were updated. The only case where there is an earlier chronology is in the 'Almazara de Agra y el Bancal de la Almazara' (Agra's Oil Mill and Oil Mill's Terrace), near Loma Eugenia. This seems to have been in use for a long time – from the Roman period to the contemporary era. The remains that have been preserved belong to the contemporary structure. However, since it stands very close to the agricultural Early Medieval village (150 m), it is likely that there was a previous structure for oil production that did not stand the test of time (Figure 11.2).

Land uses: cultivation areas and fallow (Incultum) areas (forests, pastures and ponds)

By now we could not perform in-depth studies on the historical land uses, where archaeobotanical and palynological analyzes are crucial to determine the type of crop and forest exploitation that would make these early medieval communities. However, the proximity to the hydric resources created favourable agricultural surroundings with constant efficiency. As such, there was a well-balanced rotation of intensive and extensive (non-irrigated arable crops, non-citrus fruit trees, olive trees) agricultural land. An important part of the Early Medieval economy was the management of forest and pasture areas. In the territory of the aforementioned settlements, there were mostly short forests (conifers, thickets, bushes). These were cut down every 10-20 years, producing wood for different uses. According to medieval sources (Azzara and Gasparri 2005), these forests were widely exploited all over western Europe for carbon production, limestone, resin or swine farming. In the *incultum*, these activities were an important part of the productive base of the Early Medieval rural society (Burri 2014). All of these resources permitted the self-sufficiency of the settlements and their compliance with *Eio*'s taxes. Additionally, they probably produced a surplus that would, perhaps, have been used for constructing buildings or purchasing prestigious goods such as certain imported ceramics found in Loma Eugenia (African amphorae Keay LXI, *spateia*) or some personal objects discovered among several funerary goods (Figure 11.3).

Preliminary final considerations

As we have seen, this is still a preliminary analysis of rural and suburban landscape of a portion of the territory that administratively belong to the city of *Eio*, in which many questions remain. Our goal has been to present the first archeological evidences ascribable to the postclassic landscape of the site, obtained through the application of new techniques such as remote sensing. However, as a final assessment we can reflect on some aspects still incipient.

As we have already seen, the debate focuses on establishing the type of settlement that appears in the Late Antiquity – its spatial structure and connection with the episcopal city and other power structures (urban and rural aristocracies). This will help us to understand the social, economic and ideological shapes and rhythms of this historical landscape. To do this, we should begin by creating archaeological catalogues all over the suburban areas of El Tolmo and expand the regional dynamics of the Early Medieval rural landscape.

It is essential to analyse whether the concentrated settlements, like the one in Loma Eugenia, which are considered villages, are autonomous peasant communities or subordinated to the new stately settlements, or to the *ciuitas* of El Tolmo itself. We believe that the foundation of an episcopal urban centre and the densification of different occupation types in its suburban rural area is not just a chronological coincidence. This phenomenon must reflect an economical and fiscal planification where these villages are the productive foundations of the new bishopric. The historical uniqueness of the *ex nouo* creation of a new episcopal see in El Tolmo de Minateda at the beginning of the 6th century, turns the region of Hellín into an ideal area to study and understand the dynamics of fiscal jurisdiction creation in the Early Middle Ages.

Besides the *ciuitas*, the management of the diocese would have had other larger rural centres working as intermediaries. This seems to be the case for the bishopric of *Eio*. In this sense, it would be interesting to state the presence or absence of rural aristocracies by identifying these larger centres (*turres*, *castra*), or even the existence of certain elites inside the village communities. A wider archaeological registry would make it possible to recognize possible elements of hierarchy differentiation, such as the investment in building construction or in prestigious sumptuary elements. A significant aspect is the visibility of these possible elites in the burial areas of the extra-urban

the northern shore of the Mundo river, and in Loma Lencina there are three mills in a 1 km radius (mentioned in the cartography from the end of the 19th century as *Molino* (Mill), *Molino de Abajo* (Mill from below) and *Molino Harinero* (Flour Mill).

territory. The fact that most evidence has been found in the surface makes it impossible to recognize precise hierarchy indicators in the case of rural settlements, except from the clothing and personal adornments discovered in some graves in Loma Eugenia and Torre Uchea. In both cases, the clothing seems to indicate a certain status and, significantly, once used when the owner was alive and 'amortized' after his death. If it is confirmed that the village of Loma Eugenia is the same as other archaeological registries in rural areas of the Peninsula, we could be dealing with a local community where the use of personal adornment objects and other materials need to be considered as social indicators in communities with an inner hierarchy.

Therefore, it seems that the competitiveness that reflects the use of 'rich' goods in a usually limited number of burials, refers to local village hierarchies and not subregional elites (Quirós 2013a, 229). However, this could be attributed to the individuals buried in the monolithic sarcophagi discovered in Torre Uchea, one of them with a golden ring. As we have already seen, in this territory, the burial areas have had continuity since pre-Roman times. This, together with the toponymy and existence of possible agricultural storage spaces, could mean that there was an aristocratic management and control of the production. We could suggest that there was a possible 'continuity' of the old Roman stately properties but it is now associated with another type of residence (*turris*). This still cannot be confirmed since it needs more evidence and larger archaeological registries.[20] In fact, the existence of residential towers connected to the Visigothic land aristocracy before and after the Islamic conquest (where the toponyms *turrush/burch* continue), has been pointed out in other areas of Hispania by Manuel Acién, who, in fact, used Torre Uchea among other examples (Acién, 2008, 71 and 81-82).

If this proposal is confirmed, Torre Uchea could be a part of a group that were recently detected in the same territory. For example, the site of Alboraj (Arabic toponym that means 'the tower'), where land surveys and aerial photography have confirmed a possible 'military' (large rectangular buildings, natural defence, gate access) enclave located in a high area. This is located in the same road network that connects the Visigothic city with the centre of the Peninsula and the coast. It also has a chronology that is similar to the one of the *ciuitas-madīna* (end of the 6th century and end of the 9th). However, in this case, we have not yet found any funerary context.

As a last note, it is important to confirm whether rural churches exist in the village itself or nearby. This could be achieved with an extensive excavation of these settlements. This would help with the explanation of both previous points, since the existence of these churches would give these villages a certain religious autonomy from the city. Meanwhile, the appearance of religious churches in rural areas regarding the local aristocracies, could mean that local elites in the area sponsored their construction.

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[20] However, there can be a social reading opposed to this approach, which suggests that the continuity of such spaces and the maintenance of the property is a subordiation to 'non-resident' owners capable of asking for rent and services (Gutiérrez Lloret, Grau 2012, 194).

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Animal husbandry and saltworks in the Kingdom of Granada (13th-15th centuries): the dynamics of landscapes in a Mediterranean territory

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Abstract

This paper is part of a research project focused on salt and livestock in the kingdom of Granada, the last Islamic country in Iberian Peninsula during the thirteenth to fifteenth centuries. The aim is to enhance the comprehension of the importance of stockbreeding in the configuration of the Late Medieval Landscape. Given the scarcity of contemporary written sources, and the impossibility to excavate key places related to both activities, saltwork and animal husbandry, the strategy of research has been the superficial survey and the study under the Landscape Archaeology methodology, which has been possible due to the persistence of traditional animal husbandry strategies.

Keywords: Landscape Archaeology, Nasrid Kindgom, Late Medieval History, Salt, Animal husbandry

Introduction

Mediterranean ecosystems have had a deep impact on different historical societies, some of which had to overcome unfavourable climatic and natural conditions. This was, for example, the case in Andalusi society, which put into place an irrigation agricultural system based on supplementing natural water sources via the application of strictly controlled water-catchment strategies. Adaptive strategies put in place in order to overcome the lack of certain essential natural resources were not, however, exclusive to agriculture. Specifically, we are here referring to animal husbandry and salt supply. Over a number of fieldwork seasons, the research project Sal y ganadería en el Reino de Granada (siglos XIII-XV) (SALGARN) ('Salt and Animal Husbandry in the Kingdom of Granada' (HAR2011-24767)[1] has shown that naturally dry areas were peppered with water cisterns, which were strategically located in order to collect rainwater and thus keep the animals supplied. Similarly, channel networks were built for the irrigation of artificial meadows (Malpica Cuello, Villar Mañas and García-Contreras 2013; 2017 and forthcoming; Malpica et alii 2015). Analogous networks were also constructed for the systematic production of salt. In short, Andalusi society developed multiple ways of overcoming natural shortcomings, and these have left their mark on the landscapes of the Nasrid Kingdom of Granada.

Environment and animal husbandry

The Kingdom of Granada, the latest redoubt of al-Andalus, occupied the south-eastern corner of the Iberian Peninsula, including the current provinces of Granada, Malaga and Almeria and parts of the provinces of Jaen, Cádiz and Córdoba, between the 13th and the 15th centuries (Figure 1).

The territory of the kingdom exhibits a number of physical and climatic characteristics that need to be highlighted. Although the whole region is affected by a typically Mediterranean climatological regime, not all areas have the same access to a regular water supply, essentially due to different topographical conditions; while optimal humidity conditions prevail at certain altitudes, other areas suffer from endemic drought conditions, and the differences between the coastline

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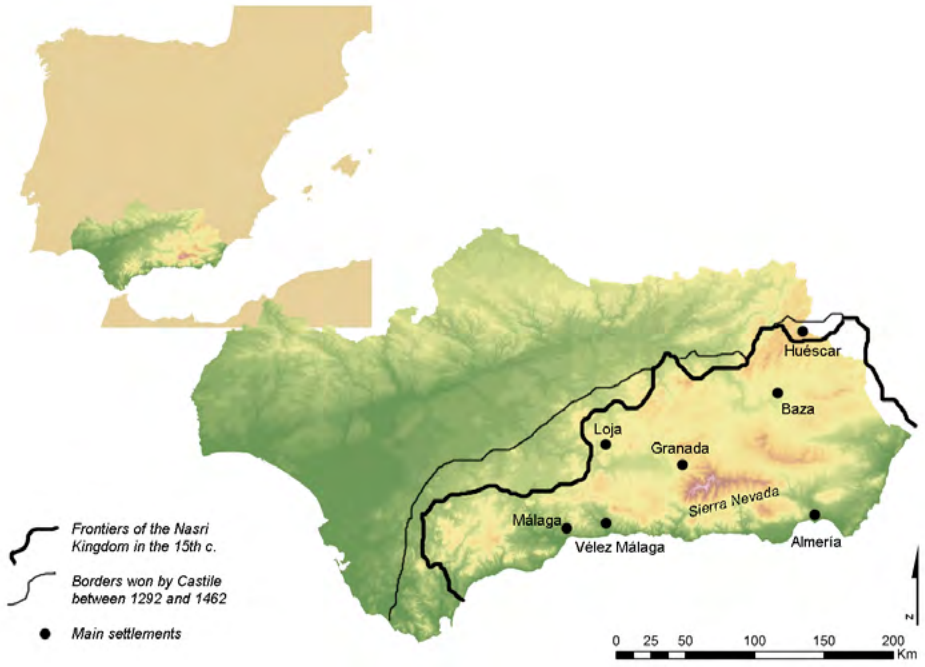

Figure 1. Limits of the Nasri Kingdom in the current region of Andalusia (South of Iberian Peninsula). The main towns cited in the text are indicated.

and the interior are very significant with regard to animal husbandry activities and the production of salt. A document, of a relatively late date, expresses this more clearly than us. It refers to the city of Granada thus:

> The city of Granada is well supplied with meat, lard and game, which is produced in the kingdom and is not brought from abroad; it is, in fact, exported. There is an abundance of winter and summer pastures, because the kingdom is well endowed with sheep, which go to the coast to graze, and in four days they become fat if they were a bit thin, and this gives the meat a nice flavour. Mutton from Granada is more expensive than poultry from elsewhere. That is why husbandmen have to keep a tally on their animals, because once the animal comes within five leagues of the city it doesn't leave, even it if is sold below its due price (Henriquez de Jorquera 1987: 87).

Several parts of this text need to be highlighted, for example the distinction between summer and winter pastures, which indicates a regular husbandry system and the existence of a series of well-established mid-to-long-range transhumance routes. The role of the city, the kingdom's economic and mercantile capital, as the focus of these activities also needs to be stressed. The importance of salt (both sea salt and salt produced in the interior) and the halophyte meadows, which were created in order to fatten the animals, should also be noted; the latter were mentioned by the Almohad scholar Ibn 'al-Awwām (2003: 801). The seasonal movement of livestock in search of the best resources is, therefore, well documented for the Andalusi period, both historically (Al-Idrīsī 1866: 39) and archaeologically (Moreno-García 2001: 261). These seasonal and regular patterns determined the human alteration of natural landscapes for husbandry purposes – alterations which can still be detected in the archaeological landscapes.

Animal husbandry in the Kingdom of Granada: the archaeological record

As we have pointed out, the climate and other environmental factors determined the sort of infrastructure constructed, in order to facilitate animal husbandry and salt production, as shown by the landscape surveys carried out under the aegis of research project 'Sal y ganadería en el Reino de Granada (siglos XIII-XV)' (HAR2011-24767) (Malpica Cuello, Villar Mañas and García-Contreras 2013, 2017 and forthcoming; Malpica et alii 2015).

Pastures and meadows

Husbandry-related material remains are nearly non-existent in areas above 1800-2000 m.a.s.l, where the humidity conditions are optimal for pasture growth.[2] Hydraulic systems for the creation of artificial meadows are much more common on the plains (and they are also mentioned in the written record). Both areas were, however, equally important for animal husbandry. High-altitude meadows were relatively abundant in the high-altitude areas of the Subbaetic and the Penibaetic

[2] Some cisterns of Andalusi date, for example in Prados del Rey (Baza), are the only exceptions to this known to date. It must be said, however, that archaeological research on mid- and high altitudes is still poorly developed in the region.

systems. The most significant example is, perhaps, the Sierra Nevada, its benefits for animal husbandry were well known in the Islamic period. According with one of the early medieval written sources for al-Andalus:

> The *Sierra Xalair* [Sierra Nevada] has very good pasture all year round, even in the summer, because water does not dry out; also, it is possible to find wild chestnuts and acorns, and there are all kind of trees. In the winter, there are good shelters to the south, facing the sea, where the animals can give birth to their young. (Al-Rāzī 1975: 292).

Paleoenvironmental analyzes conducted in Sierra Nevada suggest a low human impact on the mountain heights. However, evidence of grazing are detected in the area. First by the presence in the lake sediment of *Sporormiella* fungal spores (associated with cattle feces according with Davis and Shafer 2006) and, secondly, by increasing the incidence of *Rumex* and *Plantago*, especially from 2800 cal. BP. The scale of the study does not reveal in detail what happens in the Middle Ages, despite having a calibrated radiocarbon to the period that interests us (1520 ± 15 years BP at 20 cm deep, year 1398 AD) (Figure 2). Written sources confirms the existence of some pastures in Sierra Nevada at least during 14th-16th c., where shepherds could enter with a special permission from the Nasrid kingdoms, their agents or from owners of the properties (Espinar 2009). The studies in the Sierra de Baza provide similar data with the same scaling problem for the Middle Ages (Carrion *et al.* 2007). Between ca. 2560-160 cal years BP main forest depletion and spread of thorny matorral appears. Circa the end of the Middle Ages, *Pinus* decreases and *Poaceae* becomes dominant, perhaps as an indicator of grazing pressure[3] (Carrion 2007).

But many more similar examples exist not only from paleoambiental analyses. In some cases, toponymy has left us a significant clue: for example, in Prados del Rey (Huétor Santillán, Baza), Prados del Conde (Castril), Llanos del Duque (Huéscar), Peñón de Praomoro (La Puebla de Don Fadrique), and Prados de la Fuente del Alcayde (Loja); the toponymic evidence suggests that the elites exercised a certain degree of control over the areas where pasture was believed to be of especially good quality (López de Coca Castañer 1987: 290-291; Martínez Vázquez 2013; García-Contreras 2015). This does not mean, however, that they were exploited only by the elite, but that some limitations on their use by the local shepherds may have been in place in order to prevent the overexploitation of the best meadows. More work needs to be done in this regard, as well as in regard to the tradition of the so-called 'agdal', which is still in operation in Northern Africa and which protects common high-altitude meadows from overexploitation (Domínguez Gregorio 2017). Apart from the Nasrid examples, other cases can also be found in al-Andalus, for instance in La Buhaira (Seville) (Valor Piechota and Jiménez Hernández 2018).

At any rate, it may be worth paying more attention to an aspect that has been somewhat neglected before now: this is the construction or the use of an already existing hydraulic system for the creation of artificial meadows. This is common practice in certain flat areas where water abounds or where the surplus of an agricultural irrigation system is available for use. Even in places like the Vega de Granada, which was originally reserved for agricultural practices, it is possible to find evidence of these strategies. One mention of such a strategy is Ibn Sa'īd's description of the hinterland of the city of Granada:

> [...] the water reaches the city after the snow melts. This does not mean that this water is bad for the nearby vegetable gardens, vineyards and mills. The castle is high and inaccessible. The extension of the defence works is such that it takes around two days to walk them, among rivers, groves and wide meadows (Ibn Sa'īd 1973: 84).

There is written evidence (dated to 1453) of an unidentified piece of land in the Vega, near the city, the toponym of which has been translated as 'pasture land' (Seco de Lucena Paredes 1970: 329). Other properties owned by prominent Nasrid families in the Vega, for example one piece of land known as Alitaje, could also be interpreted as pasture land – an idea that is confirmed by the presence there of one of the few cisterns which are identified as such in the written record (*Manhal al-Liṭāj* or 'cistern of Alitaje) (Jiménez and Molina 2001: 450). Moreover, even in areas where dry land agriculture is predominant, for example in Escúzar (in the area known as Quempe, to the south-west of Granada) surplus water from irrigation systems, ravines and a number of springs were used to create artificial meadows (Villar Mañas 2016:). Other irrigated meadows have been identified in the north-west of the Kingdom of Granada, where dry conditions and saline soils, which are especially well-suited for animal husbandry, prevail (Malpica Cuello *et al.* 2015). These irrigated meadows are always found in association with water courses and springs, scarce as they are. Some examples are the La Alquería (La Alquería), Cortijo de los Prados (Venta Micena) and Cortijo del Agua, and Bugéjar (Huéscar). In all of these areas hydraulic structures have been found. These are rather basic constructions which use the slope of the nearby ravines (Malpica Cuello, Villar Mañas and García-Contreras forthcoming).

[3] As is pointed out in the study (Carrion 2007), the impact of livestock must be weighed against the impact of mining activities which were very important in the Sierra de Baza.

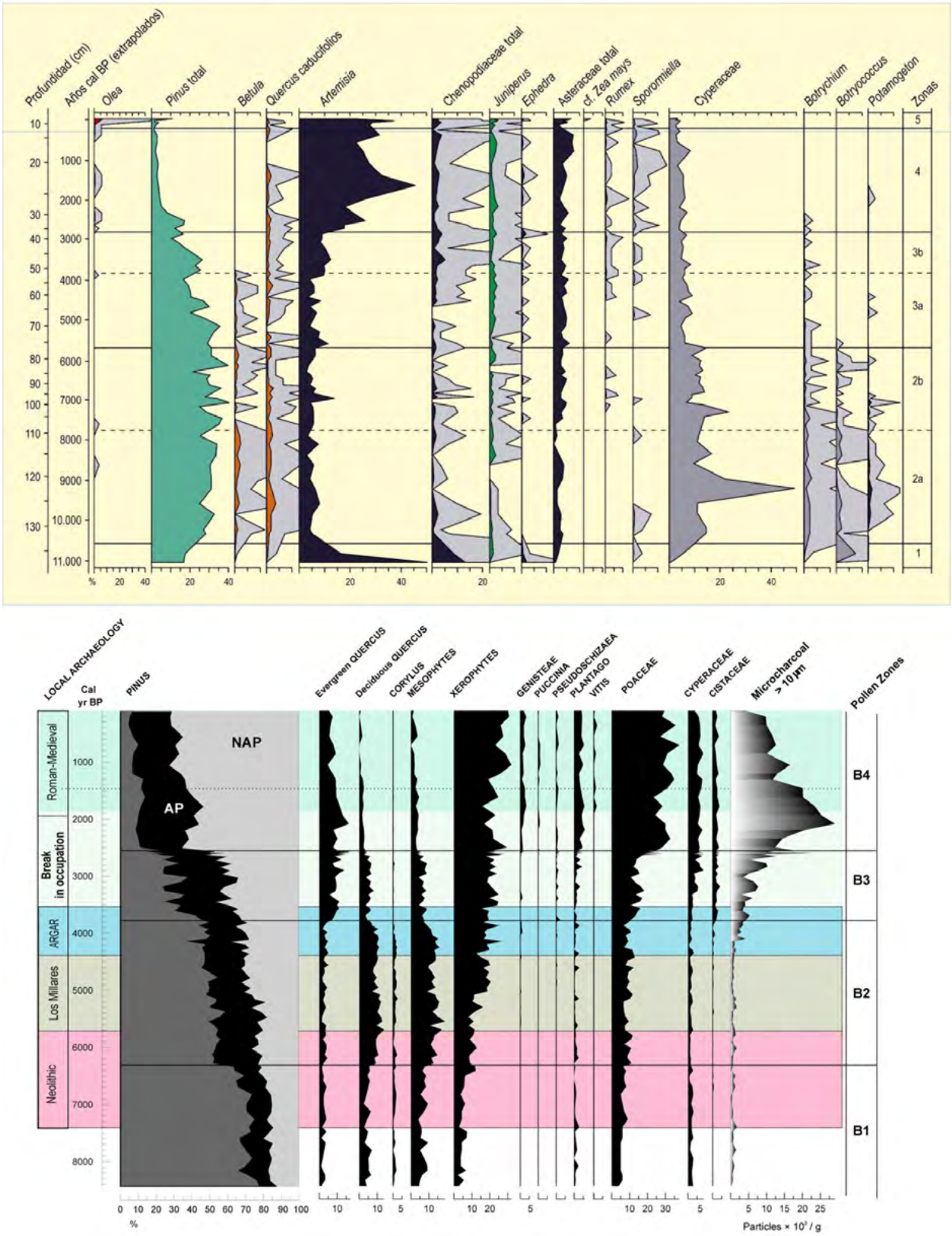

Figure 2. Above, synthetic pollen diagram of Laguna de Rio Seco. Redraw by (Carrion 2012: 856) from study of Anderson et al. 2011. Below, synthetic pollen diagram and microcharcoal variation in the Baza sequence by Carrion 2007: 1462.

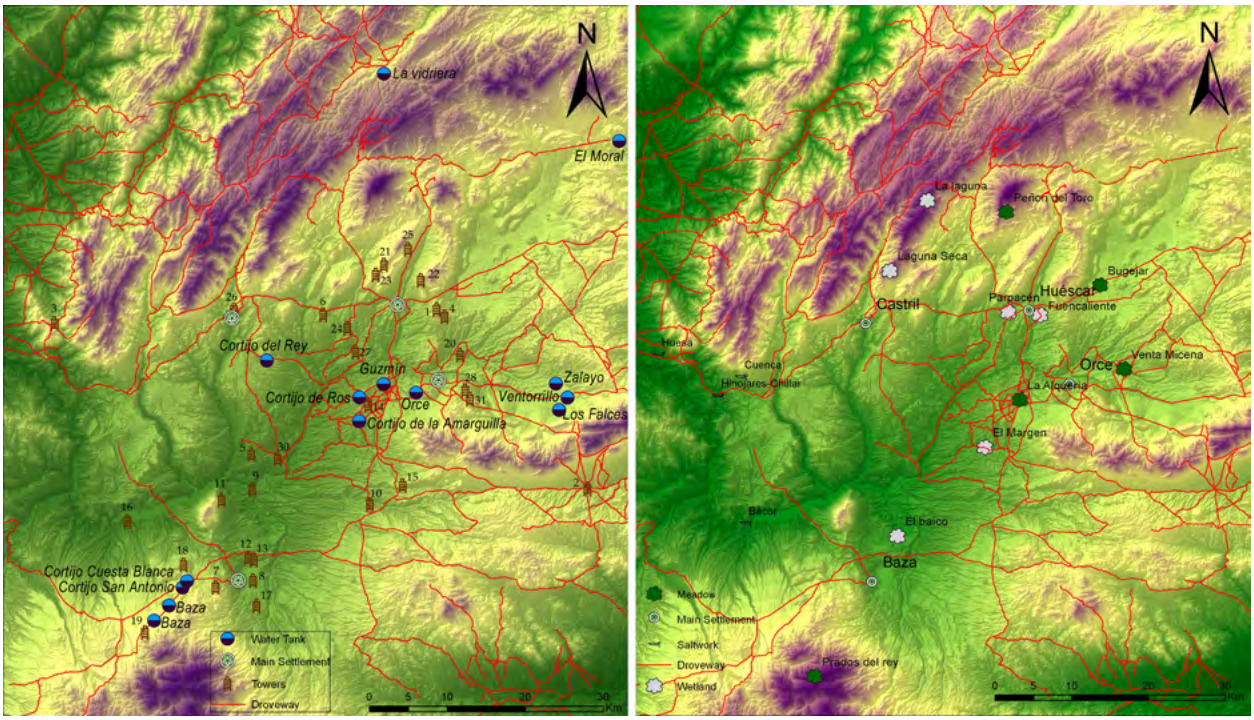

Figure 3. Archaeological and landscape indicators of livestock in Northeastern part of the Nasrid Kingdom (from Malpica Cuello et al. 2015).

Lawsuits in which the use of these pasturelands in the medieval period was contested have been abundantly attested (Malpica Cuello 2013). These meadows are found in the vicinity of the paths used by herds in the Andalusi period, of which more shortly. The idea that we wish to stress is that Andalusi society successfully transformed certain natural landscapes in order to overcome the problems faced by animal husbandry because of physical and climatic factors. Natural conditions in these areas were unsuitable for sustained agricultural and animal husbandry activities, but these transformations meant that systematic economic practices could be implemented.

Water supply

Regarding water supply, a similar picture may be found: human responses were determined by natural and ecological conditions. In some areas, no hydraulic infrastructures for ensuring the water supply of the animals have been found, especially for the Nasrid period, even though intense animal husbandry activities have been ascertained (Malpica Cuello *et al.* 2015). This is, for instance, the case with Campo de Zafarraya (Vélez-Málaga), Tejeda, Alhama and Almijara, in the south-western region of the kingdom (Ramos Ibaseta 1988; Galán Sánchez 1988) (Figure 4). In areas where water was readily available, there was no need to mobilise the local population for the construction of water troughs. Similarly, humidity conditions in the nearby mountain ranges, where the tempering effect of the proximity of the Mediterranean Sea can be felt, ensured the presence of good-quality vegetation nearly all year round.

In other areas, however, the aridity of the soil (exacerbated by a low precipitation regime) encouraged the construction of hydraulic structures in order to ensure a supply of water. Water cisterns of considerable dimensions are common in areas such as Campo de Dalías, Campo de María, Campo de Tabernas and Cabo de Gata (Almeria), and Quempe, Altiplano de Huéscar and Baza (Granada); all these areas are characterised by poor soils and the limited availability of water sources. Generally, these cisterns are large and capacious structures located in the vicinity of the paths followed by the herds. They are covered by a vault and supplied via a channel which is strategically located to collect the rainfall running downslope. The cisterns flow into an open trough through an exit channel (either directly or with the aid of a pulley). Construction techniques vary according to place, and presumably also according to the date of construction; two techniques are, however, predominant: both use masonry, but while in one of them the stone blocks have been dressed to fit (sometimes with intermediate layers of unworked stones), in the other the (larger) undressed stones are somewhat more haphazardly laid, although some effort at keeping the construction regular can always be detected. Between these two typologies, a large number of variants can be found, and this is probably related to which construction materials available to each group in the moment of construction. Most of the cisterns are internally

Figure 4. Droveways ('Vías pecuarias') in relation with medieval settlements between the towns of Vélez Málaga and Alhama and the surrounding of the Mountain Range of Tejeda, Alhama and Almijara.

waterproofed with a mortar lining, which clearly indicates their hydraulic function. There is little doubt as to the Andalusi date of most examples; this has been proven by a number of archaeological excavations (Cara Barrionuevo 2004: 179) and also by the written record (AHPGr., Apeo de los Cortijos de Granada, libro 6686, Escúzar, 087-v; Osorio Pérez and Peinado Santaella 2014: 107; Cara Barrionuevo 2002: 483). A more precise chronology cannot be attained using the information currently available, although we are certain that the construction of these cisterns was a common practice during the Andalusi period. Some authors have, in fact, pointed out that their construction began during the Almohad period (Cara Barrionuevo and Rodríguez López 1989: 645; Cara Barrionuevo 2002: 483). In fact, a recent excavation in the north of the current province of Granada has confirmed the twelfth century chronology as the time of construction of one of this water cistern (Caballero Cobos y Román Muñoz 2017), which has the same formal characteristics of the others documented in the same area during our surveys (Malpica *et alii* 2015). Therefore, we can say that there was an economic intensification based on husbandry activities during the Almohad period following during the Nasrid times.

Salt marshes and salt lakes

Salt marshes and salt lakes were essential for animal husbandry. Medieval scholars pointed out the benefits of a high salt intake for the animal diet (Ibn 'al-Awwām 2003: 801), while modern landscape studies have confirmed the recurrent association of animal husbandry-related infrastructures and salt-rich landscapes. Transhumance routes and water troughs are often found in the vicinity of these landscapes, for example in La Malaha (Granada), the systematic exploitation of which is attested at least from the Nasrid period (Villar Mañas 2013: 54-48). On the coast of Granada, some wetlands and salt-rich environments are found in association not only with winter meadows but also with a marketplace (Malpica 1981; Malpica and García-Contreras 2014). It needs to be stressed that the production of salt requires very specific geological, topographic and climatic conditions, all of which can be found in several areas in the Kingdom of Granada. The

presence of historical salt lakes in the Kingdom of Granada has been, however, ascertained at only a limited number of locations, which suggests that their artificial creation was not a systematic practice. In other areas, both in the interior and on the coastline, the animals grazed in natural salt marshes and salt lakes. This reflects social choices in the management of the natural environment, which gives some clues as to the involvement of urban elites in the rural economy, because all of the artificial salt lakes which have been documented for the Nasrid period are found in association with an urban nucleus (Bacor-Baza, Fuentecamacho-Loja, Torrenueva-Motril, La Malaha-Granada) (Malpica Cuello 2008: 64). Similarly, these salt-rich environments are always located in the vicinity of the paths followed by the herds. The relationship is twofold: the salt was necessary to the animal diet, but it was also exported, and these paths were used to transport it to the coast.

Historical transhumance routes and the control of the herds

Several additional kinds of material evidence relating to the importance of animal husbandry must be mentioned, for example, the watchtowers located in the vicinity of the transhumance paths, which were built as a means to control the main communication routes. Historical pathways are also attested in the works of a number of geographers who have described the different routes in use. These texts are dated to between the Califate and the last years of the Nasrid Kingdom (Al-Rāzī 1953; 1975; Al-ʻUḏrī 1975-76; Al-Bakrī 1982; Al-Idrīsī 1866: 247; 1989; Ibn al-Jaṭīb 1998, among many others) and also in the Christian or post-conquest written sources (Malpica Cuello 2013). Far from being abandoned, these thoroughfares are still in use and enjoy a notable degree of protection in ongoing urban planning schemes. It is equally of note that an important proportion of these droveways can be controlled from watchtowers of a medieval date, or even castles, for instance in Orce, Huéscar and Castril; most of both, castles and towers, are dated to the Nasrid period (Malpica Cuello 1996: 129-140 and 251-288). Similarly, these droveways are strategically located for transhumant practices. In addition, the presence of cisterns, salt marshes, salt lakes and defensive structures indicate the presence of other paths that are not mentioned in the texts. The urban centres were the nuclei from which this road network radiated, which tallies with the role played by cities as nodes of commercial activity. The great majority of water cisterns are located in the vicinity of these roads. It is worth examining whether this is indicative of the existence of large state-controlled herds or of their local and autonomous management by peasant communities. Some studies have already been carried out in this regard in the Altiplano, in the north of the Kingdom, and some interesting conclusions have been set out concerning the spatial relationships between different types of landscape features.

The exploitation of animal herds: the zooarchaeological evidence

Zooarchaeology is another valuable research tool for the analysis of past animal husbandry strategies. Despite the scarcity of data, a consequence of the limited number of analyses available to date (Riquelme 1991-1992; 1993; 1995; García-García unpublished), the zooarchaeological record for the Nasrid period offers a valuable insight into the general exploitation patterns.

Regarding the species exploited, the data available shows that caprines (sheep and goats) were by far the most commonly consumed, a trend that applies to the whole of the Andalusi period (Morales *et al.* 2011; Moreno-García 2013). In the only case where detailed quantitative conclusions are possible, sheep remains were significantly more abundant than goat remains (193 NRI *vs.* 12 NRI, a ratio of 16:1) (García-García unpublished). On the other hand, the total absence of perinatal caprine remains (i.e. having died close to the date of birth, either before [prenatal] or after [perinatal]) in the only two faunal assemblages studied from the city of Granada must be stressed (Riquelme 1995; García-García unpublished), suggesting that animals were not being bred locally.

The results from a recent analysis of the faunal material recovered from a suburban area of the city of Granada (Figure 5) offer a glimpse into the production and distribution system of animal products during the late medieval period in the core of the Nasrid Kingdom (García-García unpublished). The assemblage is composed almost exclusively by the remains of caprines, with sheep, as previously mentioned, outnumbering goats (Figure 6a). The analysis of the anatomical distribution of the caprine group indicates an under-representation of elements (notably cranial parts and metapodia) that are associated with butchery waste (Figure 6b). This result cannot be explained as a consequence of preservation and/or recovery biases, since teeth are robust and are unlikely to have been affected by factors of preservation, and other elements such as proximal radius and proximal and distal femur (characterised by their low bone density and thus easily destroyed in archaeological contexts) present a relatively high frequency. This evidence could, indeed, suggests that animals were *not* butchered on site, but only the meatier parts of the carcass were imported to this site for consumption. Secondly, as also stated before, it is to be remarked that not a single remain of perinatal caprine was identified. The absence of mandibles in the assemblage implies that, in order to determine the age-at-death of the sheep and goats represented, we

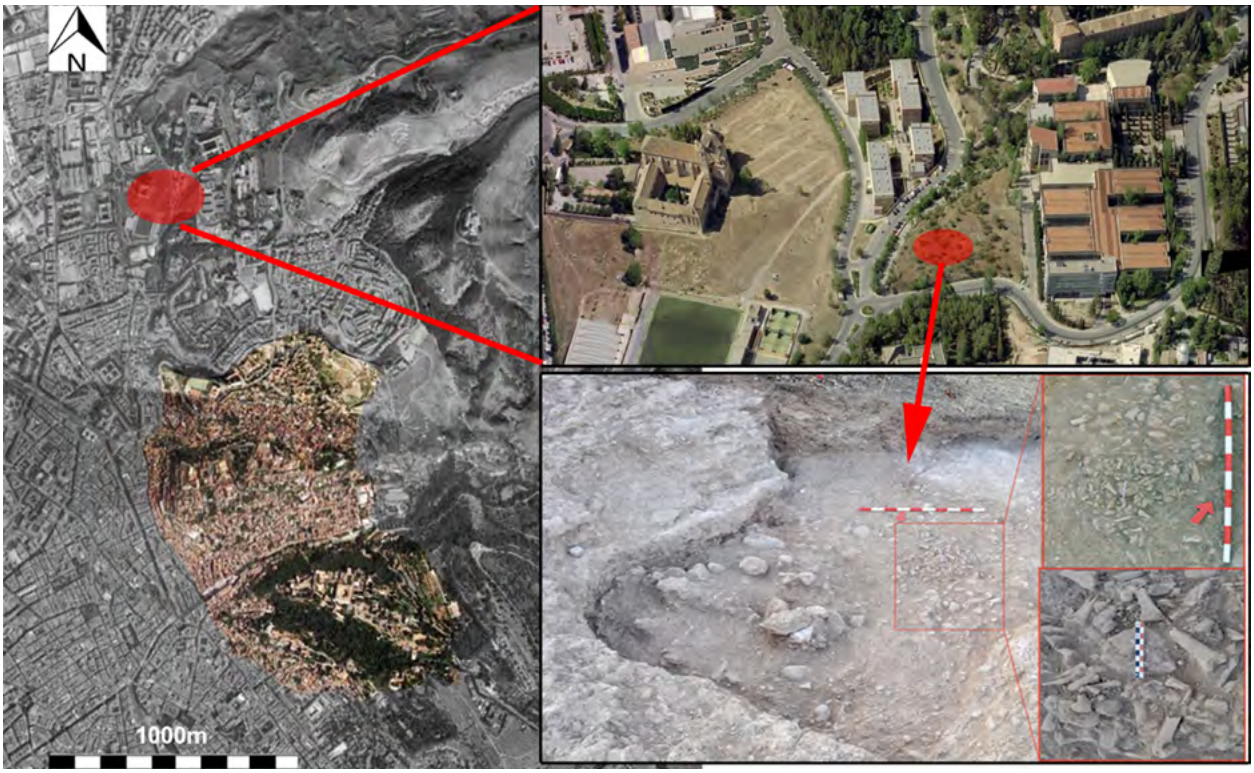

Figure 5. Location of the landfill in the outskirts of the city of Granada, ca. 15th-16th centuries. (García-Contreras & Moreno 2017). On the left, map of Granada where is marked in colour the extension of the medieval city. Above, aerial view of the archaeological site and under, pictures of the excavation process.

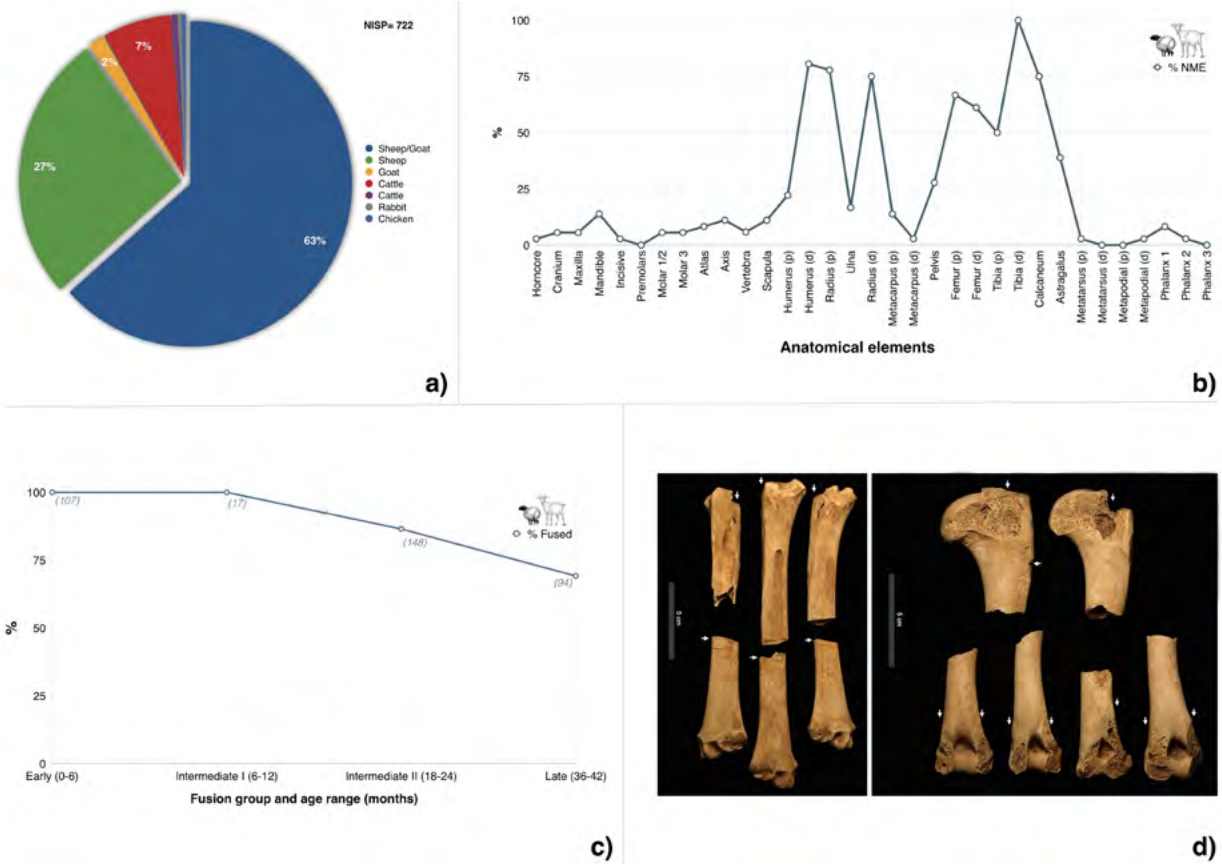

Figure 6. Results of the zooarchaeological analysis of a late medieval rubbish dump from a suburban area of the city of Granada (García-García unpublished); a) Taxonomic distribution; b) Sheep/goat body parts; c) Epiphyseal fusion in sheep/goats bones, data points represent the percentage of specimens fused or fusing in each of four sequential fusion groups, numbers in brackets are the sample sizes for each group; d) Example of radii (left) and humerii (right) systematically chopped.

have to rely only on the analysis of epiphyseal fusion, a problematic age determination technique when we have only disarticulated elements from several individuals as commonly occurs in archaeological deposits (O'Connor 2006). Nonetheless, even if they lack precision, the results do give an impression of the overall mortality profile of the caprines represented in the assemblage (Figure 6c): none of the animals died during their first year; only about 15% died during their second year and nearly 70% of they survived to 3.5 or more years old. Another line of zooarchaeological enquiry that has demonstrated especially interesting in this case has been the evidence derived from the analysis of butchery marks (Figure 6d). The pattern of carcass processing observed suggests a high level of professional specialization reflected in the high rate of standardisation in the butchery pattern examined, which permits us to assume that animals were being butchered in systematised ways by professional butchers, a pattern typical of late medieval European urban contexts.

We hold that all this evidence, particularly the anatomical representation data and the analysis of butchery marks, suggests that the group whose consumption patterns are reflected in this zooarchaeological assemblage obtained their meat through a centralised market system. However, the ageing data observed does not fit well this interpretation, since the harvest profile should include a highest presence of market-age sheep and goats (animals between 1.5 and 2.5 years old). In this case, the predominance of sheep remains, along with the abundance of adult animals (>3.5 years old) and the absence of perinatal individuals not only indicate that the animals were not being bred locally, but they also might suggest an emphasis upon wool production and the practice of mid-to-long range transhumance.

Although further analyses are essential, the zooarchaeological evidence seems to agree with the rest of the archaeological record: long-range transhumance practices appear to have been the predominant practice. It remains to be determined whether the beginning of these practices can be tracked back to earlier periods and whether the main motivation was the production and commercialisation of wool or the meat supply of urban areas. Zooarchaeology will play a key role in answering these and many more impending questions.

Conclusions

Following the research carried out within the framework of project SALGARN, a number of preliminary conclusions, to be completed or corrected by future research, may be set out now.

Animal husbandry was a key economic activity in the Kingdom of Granada, and one that left a clear imprint on the landscape and in the archaeological record in general. Peasant communities and local, urban and state authorities participated in this economic activity, which adapted to the physical characteristics of the territory, which was in turn modified in order to better accommodate animal husbandry practices. Some landscapes, especially arid ones, were transformed, while the most water-rich environments were used during the dry season. Seasonal transhumance is easily detectable, since it has left many traces in the written and archaeological records. This involved moving the herds according to a regular pattern (geographically and seasonally), which tended to produce similarly regular archaeological remains that we can now analyse.

However, sometimes the option chosen was not to take the herds along long transhumance routes, following the seasonality of the Mediterranean climate, but to use local resources with short-to-medium-range movements instead. This often involved correcting natural conditions of water and fodder scarcity by constructing hydraulic structures designed to transport and store water. Once these conditions had been corrected, animal husbandry and salt production, which were an essential complement to irrigation agriculture in the Nasrid kingdom, could be duly developed.

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A Mediterranean mountain landscape: the transformation of the Frailes–Velillos Valley

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Abstract

Recent works, especially the archaeological excavation in the castle of Moclín (García 2011: 167-84) and the Mozarab necropolis of Tózar (Mattei 2014: 181-96), have set the historical focus on the, hitherto neglected, Frailes-Velillos Valley during the Middle Ages. In addition to these excavations, several survey campaigns have contributed not so much to increase the number of known sites but to gain a better understanding of the settlement dynamics and its transformation over time, from the consolidation of the Andalusi model to the changes introduced by the Castilian conquest in the early modern period. The present work will focus on the evolution undergone by the settlement pattern between the 6th and the 15th centuries.

Keywords: Landscape archaeology. Settlement. Middle Ages. Nasrid fortresses

Introduction[1]

This work is the result of multi-layered archaeological research carried out in recent years in Frailes-Velillos, a narrow valley that links the Subbaetic mountain system in the province of Jaen with the Vega of Granada (Spain) (Figure 1). Research has essentially focused on two sites. Firstly, the Castle and village of Moclín, which are located on the 14th century frontier between the Nasrid Kingdom of Granada and Castile; excavations there were initiated in the early 1990s and, after a long hiatus, works were resumed in 2010 (García *et al.* 2011; 2012). Secondly, the necropolis of Tózar, a cemetery that was used by the Mozarab community during a relatively late stage in the history of al-Andalus (9th-12th centuries) (Mattei 2014; Mattei *et al.* 2014), which has yielded significant information in terms of social organisation. In parallel with these excavations, and within the framework of the doctoral thesis then being prepared by one of us (Mattei 2013), several extensive archaeological surveys were also undertaken; this fieldwork was funded by the Campus de Excelencia Internacional PatrimoniUn 10.

Following this research, a large volume of data was collected for the different periods, but the information still needs to be coherently integrated in order for us to offer a comprehensive perspective on the history of the valley in the Middle Ages. This is the aim of the present work. We are persuaded that the historical trajectory of the valley will be similar to that in other areas of southern-eastern al-Andalus, especially those areas which were located on the frontier between the Kingdom of Granada and Castile in the late Middle Ages. In this regard, the research carried out in the valley of Frailes-Velillos can provide a valuable reference for the study of the wider issue of southern-eastern al-Andalus in the late medieval period.

Due to its natural conditions, the valley is an ideal environment for small- and medium-sized settlements dedicated to dry land agriculture, stockbreeding and intensive irrigation agriculture in valley-bottom areas, a pattern which is also reproduced in nearby valleys (Mattei 2013: 607-656; Jiménez 2002: 67-237). Also, the valley is traversed by an important medieval thoroughfare (Mattei 2013: 472-483), such as the road that linked Córdoba, capital of the emirate and caliphate, and its main harbour, Almería. At a later period, this same road connected Granada, which was already the capital of the Zirid, and later Nasrid, and the Crown of Castile, especially Córdoba and Jaén.

Despite these conditions, until recently, specialists have shown little interest in the area, which as a consequence remains virtually unexplored in historiographical and archaeological terms. The little work that has been done is chiefly focused on the Late Medieval period and the frontier region of the hill range to the west. Most of this attention, moreover, has concentrated on the analysis of castles, originally as military fortresses and more recently as key elements in the articulation of settlement (García 2014: 54-9). At any rate, the analysis of the territory in itself, of the associated settlement, and of the human-driven transformations of the

[1] This research was undertaken as part of the Projects 'Transformaciones paisajísticas en la frontera medieval entre Granada y Castilla. Aplicación de análisis paleoambientales y arqueológicos al patrimonio natural y arquitectónico del pasillo Guadajoz-Belillos', (CEI PatrimoniUN 10) and 'Los agentes locales del poder en el Reino Nazarí: impacto en la red social y capacidad de liderazgo' (MINECO ref. HAR2011-24125).

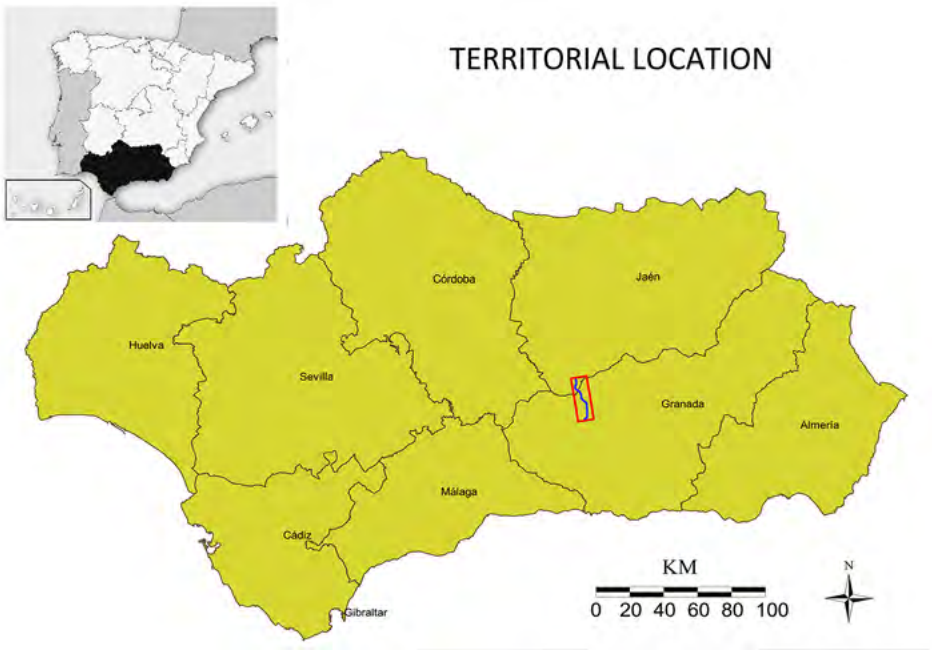

Figure 1. Location of the study area.

landscape remains largely understudied. Our target is promote a more comprehensive understanding of the dynamics affecting settlement and the landscape, something which is not possible if the analysis is restricted to a limited set of significant landmarks.

The Frailes-Velillos Valley

The valley of Fraile-Velillos is part of the rugged region known as the Western Hills of Granada, which is located in the central sector of the Baetic System. The physical conformation of the system is characterised by the alternation of lofty crested limestone hills and lower formations, the substrata of which are made up of softer types of rock. The higher formations are rich in underground aquifers; as a result, many springs are present in the lower areas (Rubio 2006: 228-232), where the limestone formations come into contact with the sedimentary rock substrata. Water supply is, therefore, plentiful.

The specific area which our research focused on is characterised by NW-to-SE abrupt crests, which repeatedly cut across the valley. At the narrowest point of the valley the river has had to carve a narrow gorge, known as Gollizno, a place of outstanding natural beauty. The areas to the north and the south of this gorge open up in a series of gentle, rolling

Figure 2. Soil and vegetation present in the Frailes-Velillos.

hills, which have been traditionally exploited for dry land agriculture. This agricultural regime is favoured by both the climate conditions and the geological substratum: there are moderately evolved, medium-depth soils, which are fairly well endowed with organic matter and are capable of sustaining a prolonged exploitation if adequate agricultural strategies are followed. At any rate, the implementation of a dry agricultural regime would have involved clearing the indigenous vegetation, essentially comprising holm oaks and Mediterranean scrub (*cornicabra*, *espino*, *retama*, rosemary), remnants of which can still be found in the less accessible areas (Valle *et al.* 2001:19-48) (Figure 2). The area under analysis includes the basin of the Frailes-Velillos River and the main road that follows it from S to N; this encompasses an area which is approximately 200 km^2 in size, distributed among three municipalities (Pinos Puente and Moclín, in the province of Granada, and Alcalá la Real, in the province of Jaén), whose territories extend beyond the limits of the valley. The basin can be divided into three areas: the southern area, which goes from the town of Pinos Puente to Moclín on River Gollizno; the area to the N and NW of Moclín; and, the area near Alcalá la Real.

The transformation of the valley in the medieval period

The archaeological work carried out in the valley of Frailes-Vellilos has combined a variety of methodologies (excavation, the analysis of standing buildings, landscape survey, etc.), and several chronological horizons have been identified. Some of the settlements have been documented only by survey and are pending a more detailed examination, but have been taken into consideration for the purposes of settlement analysis.

Prehistory

The natural conditions are well-suited to human inhabitation, and traces of the human presence can be traced back to prehistoric times, at least to the 3rd millennium BC. Prehistoric human groups seem to have made intensive use of caves and rock shelters and to have exploited the abundant natural resources on a hunter-gatherer basis. The territory around Moclín is rich in these caves and rock shelters, many of which are decorated with cave art (García-Pellicer 1959; Carrasco-Pastor 1980; Cantalejo 1983). Stone tools have also been found in abundance at a number of sites (Cueva de Malalamuerzo, Cueva de las Vereas, the caves of Bermejas and Araña, Tajo de la Cañada de Corchera, the rock-shelters of Corcuela, La Solana and Las Canteras) (Contreras-Carrión 1979). A dolmen has also been found in Pileta de la Zorra de Tózar (Pellicer 1964; Ferrer 1981) (Figure 3).

The Roman period

A solid Roman presence has been documented around the city of Ilurco, the largest settlement in the area, which is located in the Cerro de los Infantes (Pinos Puente), towards the bottom end of the valley. It is important to examine briefly the most significant characteristics of this chronological horizon, since it immediately precedes the medieval period, which is the focus of our research.

A territorial analysis of the area under the administrative control of Ilurco (Morales-Castillo 2009: 269-308) has

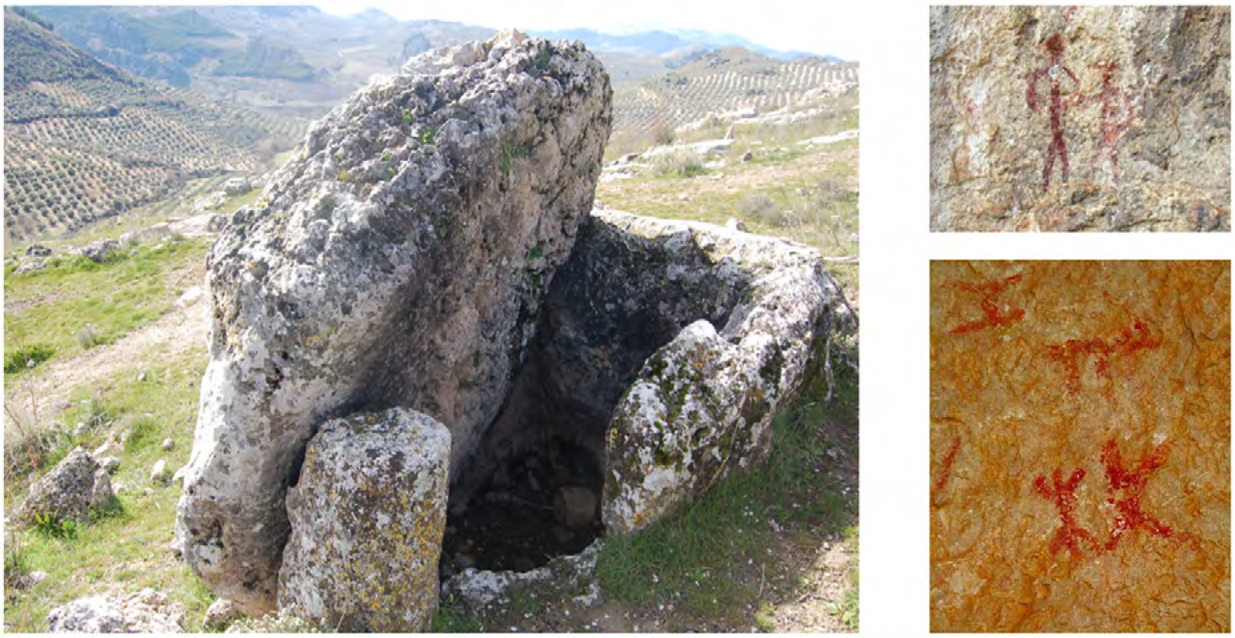

Figure 3. Dolmen and cave paintings in the valley of the river Frailes-Velillos.

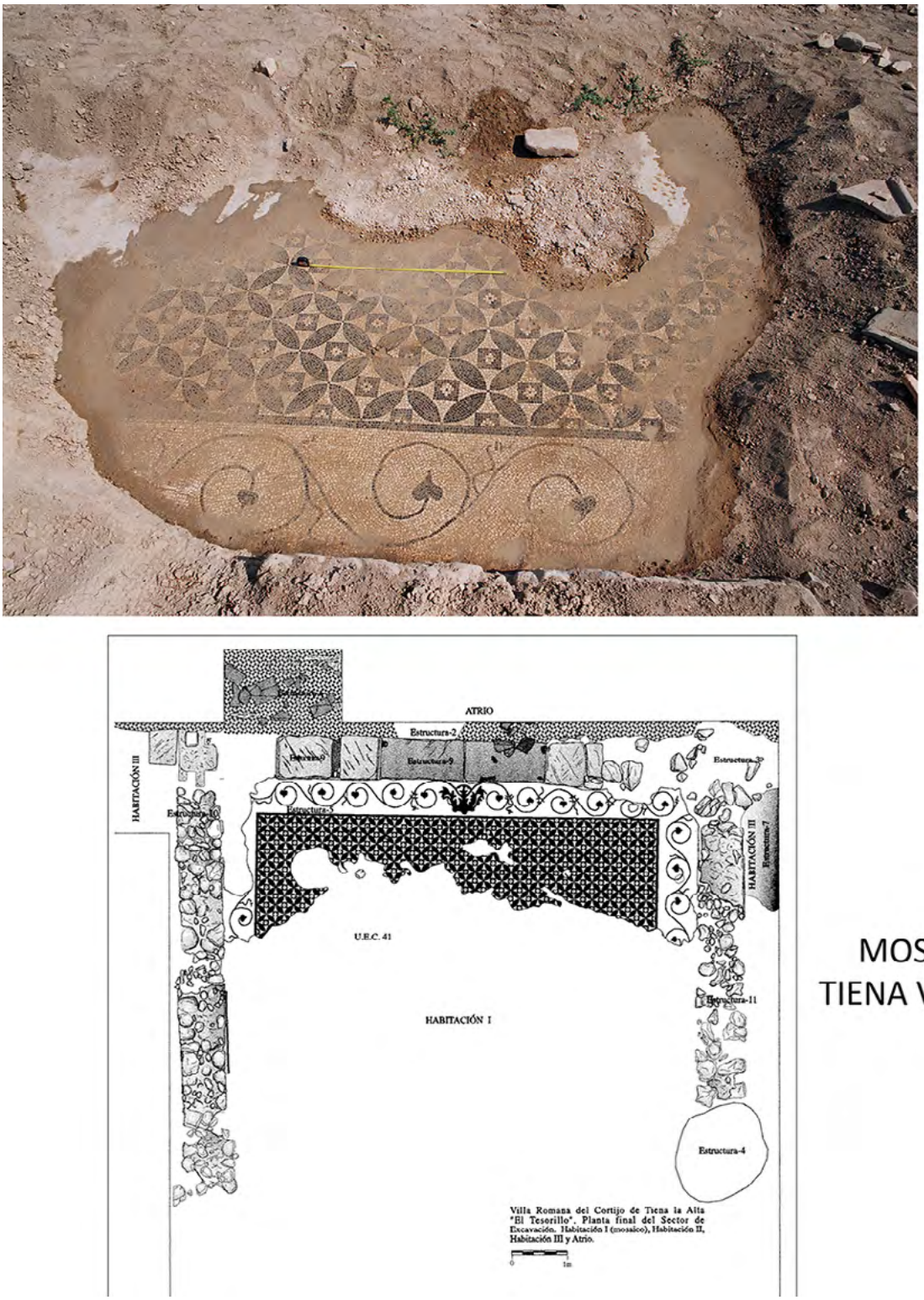

Figure 4. Mosaic found during the excavation of the Tiena villae.

revealed that the landscape was densely occupied. There are a large number of *villae* and other types of small settlements, especially during the Late Empire. The occupation density seems to slacken from the late 4th century onwards (Wickham 2007; Chavarría 2007).

It is, however, possible to characterise different occupation patterns in the valley during the Roman period. Thus, settlements are more numerous in the southern half, probably because of the proximity of Ilurco, located at the head of the valley. The settlements

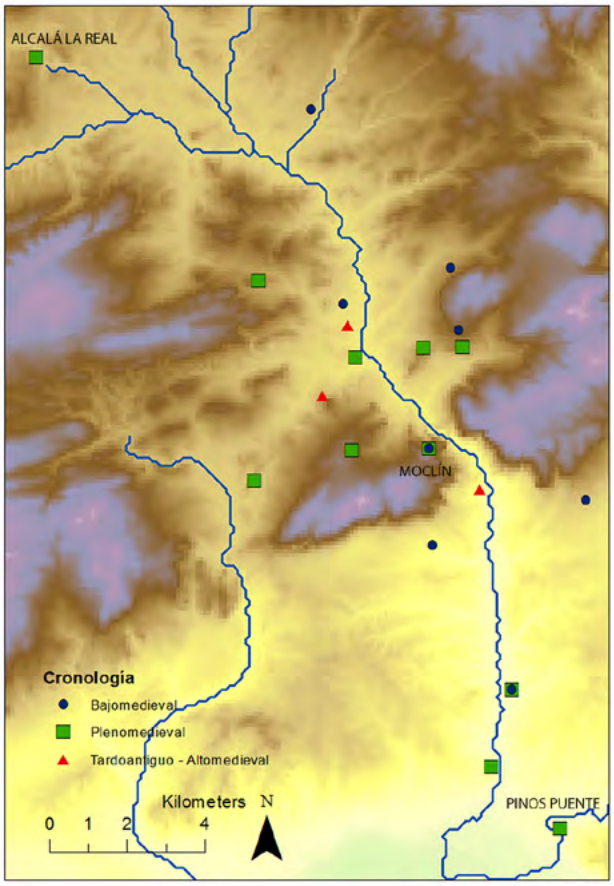

Figure 5. Location of the medieval sites in the valley of the river Frailes-Velillos.

found in the northern half (Mingoandrés, Esquiladero) are not only fewer but also smaller.

Most small farming settlements have been identified in the proximity of Ilurco. They occupy the nearby hill slopes and are often associated with water sources, which were seemingly only used for human supply, extensive agricultural fields and grazing areas.

Villae tend to be located somewhat further away from the main settlement. They always occupy a position that is midway upslope, and they are less intimately connected with the valley bottom (Tiena la Alta, Limones) (Carretero 1998) (Figure 4). These *villae* made use of the gently sloping hillsides during the implementation of extensive dry land agricultural practices, especially the cultivation of olive trees and cereal. Also, olive crushing activities are indicated by the large number of circular and conical millstones found in the vicinity of the settlements. They are, in all probability, associated with the *villae*'s *pars rusticate*, for example in Limones and Olivares (Morales-Castillo 2009: 269-308).

In addition to these domestic and agricultural settlements, which have been dated to the Roman period on the basis of the associated pottery finds, a quadrangular defensive structure was also identified. It was located on a hilltop near the Fraile-Velillos River, close to Olivares, and it controlled the southern access to the gorge of Gollizno.

The early middle ages (5th-8th centuries)

Few settlements dating to the 5th-8th centuries have been identified to date, and no settlement pattern can, therefore, be proposed as of yet. A number of hilltop settlements have been attested in the nearby regions (Carvajal 2008), which may suggest that a period of instability and insecurity prompted the population to seek refuge at easily defensible points from which the territory and the communication routes could be controlled more effectively. To date, none of these settlements have been identified in the valley, although a few isolated and hard-to-access sites, for example Gollizno, could tentatively be ascribed to this category. Gollizno is located on a mid-sized rock spur, and some associated unglazed pottery finds may suggest a date within this period. Similarly, there is a potential settlement under the modern village of Olivares, as

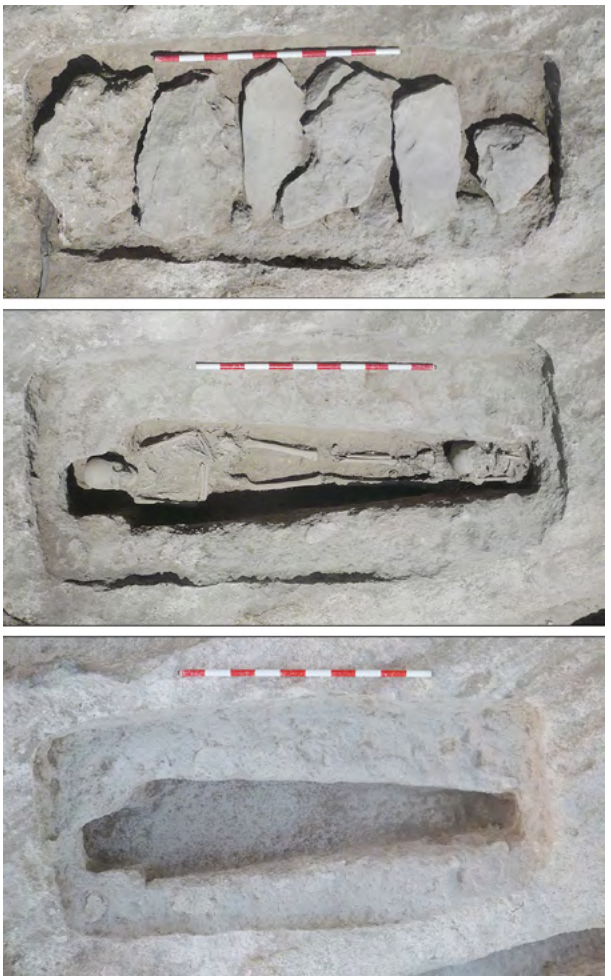

Figure 6. A grave of the village and the necropolis mozarabs of Tózar site.

Figure 7. Old walls in the places of the Los Angeles farmhouse.

suggested by the presence of unglazed and crude pottery in the vicinity.

The relative scarcity of well-dated localities from this period can be due to a variety of reasons. On the one hand, it is possible that the chronological span of some minor settlements goes further than has been recognised heretofore; it is difficult to be certain of this only on the basis of surface pottery finds. On the other hand, it is plausible that, in this period, the population focus moved away to the other face of Sierra Elvira, where some important early medieval settlements exist (Iliberis?). These were later superseded by the foundation of Madinat Ilbira, in a pattern which has been identified elsewhere on the outskirts of the Vega de Granada, for example in Cerro de los Infantes (where an early medieval phase may exist, although this is has not yet been confirmed) and Castillejo (Pinos Puente).

9th-11th centuries

The central centuries of the Middle Ages witnessed a substantial transformation of the settlement patterns in the valley. A large number of new settlements emerged throughout the valley, from the hills of the Subbaetic system, in the province of Jaen, to the outskirts of the Vega of Granada and the central area of the valley (Mattei 2012). The pottery found in association with these sites seems to suggest a date in the 9th century for the first occupation, and at some of the sites there is continuity of habitation until the 12th century. Some examples are the sites of Tózar, Fuente Pilarejo, Torre de la Porqueriza, Castillejo de Pinos Puente, Cortijo de los Ángeles and Búcor (Figure 5-6). Most of the pottery sherds identified are well made, they have been treated with a glazed slip, and they can be dated to the 10th-11th centuries (Mattei 2013: 629-639).

These settlements tended to occupy mid-slope positions (with the exception of Búcor and Cantares, which are located by the river), near water sources, which were used for human supply and for the irrigation of small vegetable gardens that were created around the new settlements. The irrigation areas identified to date are of very modest proportions. For this reason, we believe that the economic focus of this phase cannot have been so different from that of the preceding period: dry land agriculture and animal husbandry, which were especially suitable for the prevailing natural conditions and which were, perhaps, also encouraged by the conditions of political and territorial instability that characterised this period, with the *fitna* first and, eventually, with the emergence of the Zirid *taifa*. These considerations must, however, be taken with extreme caution, because it is likely that some irrigated areas, which were to become very significant in the following period, were already beginning to emerge in the 11th century. These were small settlements located on the valley-bottoms, near the river and within the limits marked by the so-called 'rigidity line', set up by the secondary irrigation channels. In this regard, the settlements of Búcor and Cantares, clearly stand out among its contemporaries. They have been characterised through the identification of unglazed pottery assemblages, including large pots with profile in S and upturned lips (in the case of Cantares). It is plausible that a new type of settlement, which was to take final shape at a later date, was beginning to emerge throughout the 11th century.

Most of these settlements exhibit no evidence of having had an earlier stage, either in Roman or in early medieval times (with the exception of Cortijo de los Ángeles, where some construction materials taken from the city of Ilurco were used), although in some cases earlier remains are not too far off, for example the sites of Búcor and Tres Hermanas. There is, therefore, a clear rupture in the Roman settlement pattern. The population relapse suffered by the region in the early medieval period must have facilitated this parting from the previous settlement pattern. In this period, two types of settlement can be distinguished: those situated in the interior of the valley (Búcor, Tózar, Fuente Pilarejo, Torre Porqueriza), which do not appear to be equipped with defensive structures, and those located on the outskirts of the Vega of Granada (Cortijo de los Ángeles and Castillejo de Pinos Puente), which were surrounded

by a solid wall. The wall around the site of Cortijo de los Ángeles was built on top of a Roman structure, and some authors have suggested that a fortress existed (Molina *et al.* 1983: 699; Martín-Martín 1999: 47-48) (Figure 7). Castillejo de Pinos Puente is also encircled by a series of defensive structures. Both sites are situated on high eminences, considerably above the Vega of Granada, at a point from which the intersection between the Vega and the valleys of Velillos and of Cubillas can effectively be controlled (in the case of Velillos, from Cortijo de los Ángeles, and in the case of Cubillas, from Castillejo de Pinos Puente, which, in addition, directly controls the Califal bridge that crosses the river at this point). Although these settlements are not fortresses in a strict sense, they were considerably fortified, and it is worth enquiring whether their construction had to do with the protection of the nearby peasant communities or the control of the territory. Both sites are related to other coeval settlements in nearby valleys to the SE and the Vega of Granada. In addition to these settlements, two potentially interesting locations were identified during survey: Lomo de la Era and Pozo del Milagro. These sites were identified through the discovery of a doorjamb and an assemblage of ceramic coarse wares, some of which present a typically 10th-11th centuries green glazing. These were small settlements located on top of medium-sized hills, with good visibility around, not far from the main road that linked Granada with Alcalá la Real, in areas where the road becomes narrower. These characteristics suggest that the settlements could well be military in nature, or at least that their purpose was to control the road. We have not been able, in any case, to identify defensive structures or watchtowers, so it is also a possibility that these settlements were no different from the agricultural and farming communities found elsewhere in the valley. Whatever the case may be, their privileged position cannot be ignored, especially the fact that they are located where the road becomes narrower. It is, therefore, tempting to speculate with a settlement created on the initiative of the political rulers (either central, regional or local) or in order to respond to the defensive needs of the local communities, complementing the role played by the castles located at the head of the valley. At any rate, this hypothesis cannot be confirmed with the current state of our evidence, and the interpretation of these sites will necessarily have to be framed within a broader historical narrative.

Several factors need to be taken into account to explain this change in the settlement pattern. The region is traversed by a natural communication route that links two key cities for the geography of al-Andalus. Almeria was, the most important Andalusi harbour. The pottery wares found in association with these settlements were not local manufactures, which suggests that relatively well-developed trade networks, which have not yet been identified, were in operation. It is likely that agricultural surplus was also commercialised via these mid-range commercial networks. In addition, the imposition of a new political system in the early 11th century may have sparked a change in the settlement pattern. It is plausible that some settlements were consciously developed, for example Castillejo de Pinos Puente and Cortijo de los Ángeles, or created anew, for example the Castle of Moclín, in order to play a role in the control and organisation of the territory around them.

The excavations carried out in recent years have revealed that the earliest structures found in association with the fortress were built in the 11th century. The

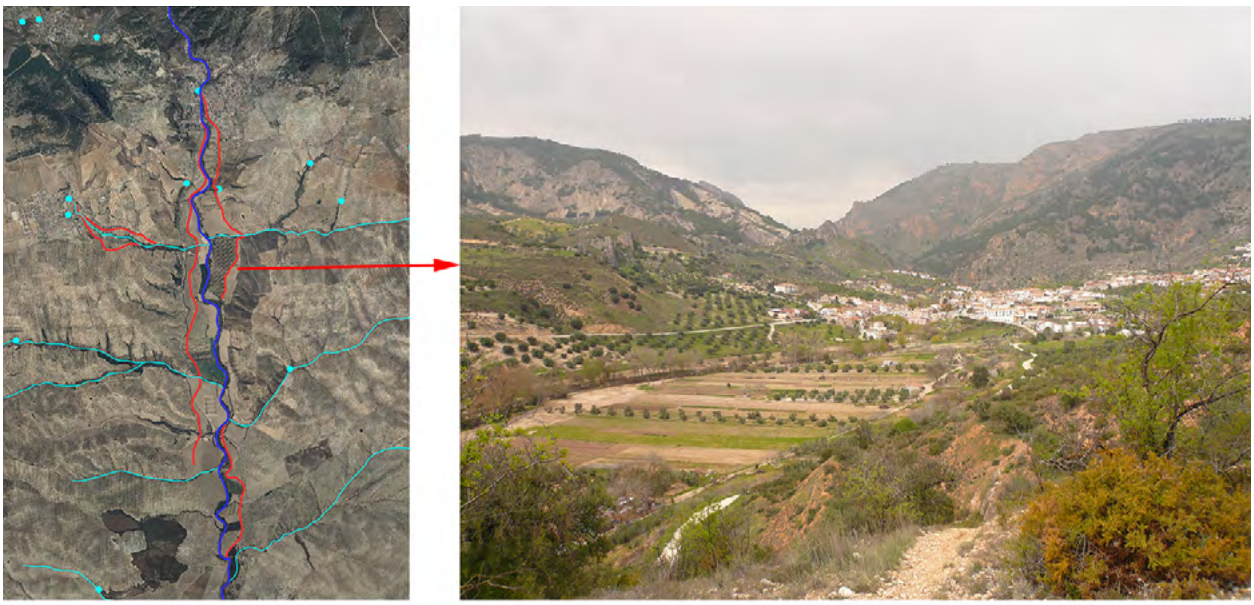

Figure 8. Irrigated areas of the southern part of the river Frailes-Velillos and detail of the vega Baeza.

Figure 9. Panoramic view of the castle of Moclín.

Figure 10. Tower-Gateway of the castle of Moclín.

upper enclosure (the so-called Alcazaba) is the earliest phase: it is composed of two towers of cemented rammed earth and the entrance to the original fortress (García 2012: 66). This is a rather primitive plan by Andalusi architectural standards. These towers are by far the most solid structures in the region and they dominate the course of the Velillos River; they may, therefore, be plausibly identified as the mythic fortress of Belillos, mentioned by the King of the Sevilian *taifa* al-Mutammid and the Castilian King Alfonso VI ('Abd Allammid and the 2010: 178-9). The fortress was built by the *taifa* King of Zirid Granada in order to control the surrounding territory.

12th-13th centuries

In the12th-13th centuries, the settlement pattern initiated in the preceding phase was consolidated and expanded to reach the bottom of the valley, as shown by the results of the archaeological survey. New domestic and economic structures were built. In contrast with those of the previous period, these structures seem to have been integrated with one another in order to form more complex nuclei. At the same time, most of the settlements occupied in the previous phase seem to have been abandoned. It would appear (future research will help to confirm or reject this preliminary interpretation) that the occupation and exploitation regime of the territory responded now to more complex principles; new, larger and more elaborate exploitation areas were created, for example the vegas of Búcor, Baeza, Olivares (Figure 8) and, probably, also the area around the acequia (irrigation channel) of Esquiladero. The irrigated terraces of Tiena may also be included in this category (Mattei 2012a). Some of these vegas, for example those at Búcor and Esquiladero, may dig their roots in the preceding period, but they reached their apogee during the 12th and 13th centuries. The vegas of Búcor, Baeza and Olivares seem to be part of a project to implement an intensive exploitation regime at the bottom of the valley and thus increase production. This follows a general trend that has been identified elsewhere in al-Andalus. This was a gradual process, the early stages of which may be traced back to the preceding stage; the key period for this process of agricultural intensification is, at any rate, the Almohad period.

The presence of higher political powers in the valley is increasingly visible. The fortress of Moclín, for example, was enlarged and reinforced in this phase. The hilltop was fully fortified in this period. Recent excavations have revealed a surrounding wall of notable proportions and perimeter. The entrance to the precinct, which was originally built of cemented rammed earth, was rebuilt using the same material, which was now reinforced with lime. The plan of the gateway was left unaltered. New towers, which were also built of rammed earth and lime, were constructed in the Almohad period (for example, towers A and B, in the southern face of the wall precinct). The structures erected in association with these towers were built with masonry. The homogeneity of the technique suggests that the new constructions were part of a coherent programme that had been ordered by the higher political authorities, a general trend that can also be found elsewhere in al-Andalus (García in press a).

The Nasrid period (14th-15th centuries)

The habitation of the valley was clearly affected by the establishment of the frontier between Granada and Castile. After the conquest of Qalat Yahsub by Alfonso XI,

in 1341, this city became a crucial military springboard for the Crown of Castile; a large number of campaigns and expeditions set out from here. In response, the Nasrid kingdom reinforced its defences, especially the castle of Moclín, the closest fortress to the newly-named Alcalá la Real.

The castle was reinforced in its upper part with a double wall, to the north and south of the preceding one, as well as with a new precinct, which encircled the southern slope of the hill, facing the Vega of Granada. The occupation of the southern slope followed the concentration of the population around the castle, which was caused by the new threats. This process, which can also be attested at other similar fortresses (Malpica 2001), may have involved the depopulation of part of the valley. In fact, the territorial analysis shows that, in this period, clearly differentiated patterns existed in the northern (Frailes River) and southern (Velillos River) sectors of the valley. In the southern area, on the one hand, the settlement and economic patterns seem to have remained pretty much the same as they were in the preceding period (sites of Búcor, Baeza, Olivares and the agricultural area of Tiena).In the northern sector, on the other hand, no evidence for intense occupation has been found, with the exception of Cantares; the establishment of the frontier, moreover, seems to have a considerable effect on population patterns, for example by the disappearance of most valley-bottom settlements (one exception is Esquiladero), and the growth of mid-slope settlements such as Tózar and Limones). More research is, however, necessary to confirm these ideas. This probably means that this sector of the valley was partially abandoned, and that only some economic activities were continued in the face of the danger posed by frequent enemy raids. Moclín grew and turned into the main population nucleus in the valley (Figure 9), despite not being close to the river; it soon acquired the characteristics of a nearly urban centre (Malpica 2008).

One such characteristic of this new Moclin was the greater presence of the Nasrid power. This is mentioned in the written record, but it is reflected even more clearly in the archaeological record; the construction model adopted closely mirrors that used in other Nasrid fortresses, which means that the new works were carried out on the initiative of the Nasrid crown; also, a number of buildings, which were associated with the activity of these agents, were built inside the precinct, for example the monumental Tower-Gateway (Figure 10) and the keep over the summit of the hill (García in press).

The modern period (16th-17th centuries)

The Castilian conquest of the Nasrid kingdom brought new changes to the settlement pattern. Now, the population was distributed according to the needs of a society that was half way between feudalism and a new modernity that had little in common with the Andalusi precedents. The process of concentration around large settlements (Tózar, Limones, Mures...) continued, although in the specific case of Moclín the castle was abandoned and the population expelled outside the walls.

Similarly, the agricultural exploitation of the *vegas* on the riverbanks became more intense, facilitated by the end of the endemic situation of war. With the arrival of the Christians, some hamlets disappeared, while others were replaced by *cortijos* and *cortijadas*, a new settlement/exploitation model which has survived to today. The most significant examples are La Matanza, el Rodeo, El Esquiladero, Baldío Bajo, Baldío Alto, Enmedio and Baeza, around which we have found ceramic coarse wares dated to the 16th and 17th centuries.

Conclusion

The present work aims to fill a research gap. Until now, the Frailes-Velillos Valley, part of the central sector of the late medieval frontier between Granada and Castile, had not been subject to systematic territorial analysis. The only research to have been carried out to date was focused on the Castle of Moclín, a crucial territorial landmark, and the necropolis of Tózar, a settlement with very specific characteristics. The analysis here presented facilitates a better understanding of the changes undergone by this territory in Late Antiquity and the Early Middle Ages, the new settlement and exploitation pattern developed from the 10th and 11th centuries, the intensification of economic practices in the 12th and 13th centuries, and the important transformations brought about by the establishment of the frontier in the 14th century and, finally, the Castilian conquest in 1486.

The next step will be to go beyond reconstructing change, with a more in-depth analysis of the processes undergone by settlement patterns. Palaeoenvironmental studies, some of which are already in progress (pollen analysis, isotopic analysis and zooarchaeological analysis) will, no doubt, play a central role in the future study of this important historical landscape.

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Urban foundation and irrigated landscape construction in the medieval western Maghreb. Aġmāt (Morocco)

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Abstract

This article examines the genesis of the city of Aġmāt Ūrīka (Morocco), a Medieval regional capital about 30 km south of Marrakech (founded later by the Almoravids), as well as the evolution of irrigation and the city's supply network. Although this network has evolved over the centuries, it is still observable today. A field survey, the analysis of vertical aerial photographs and the observation of the archaeological remains of the city itself allowed the establishment of a relative chronology. This research leads to the conclusion that the urban foundation of Aġmāt and the establishment of the irrigated network were indeed contemporary, while the historic sources suggest dating this joint process to the 9th century.

Keywords: Irrigated Systems, Constructed Landscapes, Medieval landscapes, Urban Foundation, *Ḥawz*, Morocco

Introduction

There are very few landscapes, at least in our latitudes, untouched by human intervention. Among the most obvious examples of man-made landscapes we find the irrigated landscapes, in which easily accessible water resources must have been monopolized in order to recreate an artificial nature that allows, in turn, to increase agricultural efficiency or, moreover, to cultivate non-native new plant species. Regarding the Iberian Peninsula, an intense debate was created a few years ago, which is now happily overcome, referring to the Roman or Islamic origin of large irrigation systems. However, the issue can't be raised in the same terms and with the same intensity for the western Maghreb, because in the Romanized area, little extended and limited to the Tingitana Peninsula and the northern Atlantic plains, significant traces of ancient irrigation haven't been found.

Figure 1. The barren city of Aġmāt Ūrīka at the northern foothills of the High Atlas. Urban area excavation in progress (Photo P. Cressier).

Figure 2. The ḥawz of Aġmāt dedicated to horticulture and arboriculture (mainly olive trees). In the background, the Tāsġīmūt plateau, the great fortress built by the Almoravids after the conquest of the region (Photo P. Cressier).

It seems that the *drastic* change happened after the Arab-Islamic conquest according to some imprecise sources of information. Recent investigations tend to link this process to the urbanization that took place in this vast area during the late eighth century or early ninth century (Cressier and Meouak 1998).

We intend here to delve into this subject basing our conclusions on a case study relatively well documented by textual sources and within which we were able to perform particularly helpful fieldwork.[1] It is based

[1] Under the Franco-Moroccan cooperation archaeological project 'La naissance de la ville islamique au Maroc: Nakūr, Aġmāt, Tāmdult' (1995-1999), led by P. Cressier (CIHAM-UMR 5648, CNRS, Lyon) and L. Erbati (INSAP, Rabat). In addition to the CNRS and INSAP, two other institutions supported this program: the Casa de Velázquez (Madrid) and the French Ministry of Foreign Affairs.

on the barren city of Aġmāt and its nearby territory located at the piedmont of the High Atlas (Figure 1), and whose political and economic role was relevant as head of an autonomous state in the early Middle Ages until the conquest of the Almoravids (Figure 2).

After the ruin of the city, a hamlet that was organized in different groups occupied the solar, and its population never lost the memory of its origins. Known since the early twentieth century by French explorers and military (Doutté 1914: 1-32), the site is now suffering the excesses of uncontrolled urbanization due to the expansion of Marrakech and only a very small part has taken benefit of the protection: the landscape that will be described and discussed later is now in process of destruction.

Contribution of the written sources. First hypothesis

The foundation of Aġmāt: a process still poorly known

Since its foundation, Aġmāt seems to have been a double city, organized in two urbanized cores which were located 6 or 8 miles away (11-15 km) (al-Bakrī 1965: 291; al-Idrīsī 1983: 77-78; Waṭwāṭ in Fagnan 1924: 48) and whose names come from the two founding groups, -although their inhabitants not necessarily belonged to these two tribes, Aġmāt Ūrīka[2] and Aġmāt Aylān.[3] Undoubtedly, this peculiarity has more to do with the previous organization of the local settlement, -which had a tribal character-, than with a process similar to that of the double city of Fez, which was a result of the successive initiatives Idrīs I and Idrīs II. We also know that Aġmāt Ūrīka and Aġmāt Aylān had political and economic functions, as well as different urban rules (al-Muqaddasī 1960: 9; al-Bakrī 1965: 291). Only the vestiges of the former have been identified, about 30 km south of Marrakech, a city that was founded many years later by the Almoravids; however, we still ignore the location of the second one, although the texts indicate that it was located along the road from Marrakech to Aġmāt Ūrīka (al-Bayḍaq in Lévi-Provençal 1928: 112-3). The landscape study that we present in these pages is focused almost exclusively on the latter.

We do not know the date of the foundation of Aġmāt. The earliest textual references date back from al-Ya'qūbī times, an oriental author of the late ninth century (al-Ya'qūbī 1962: 31 –Arabic p. 30–). However, this city is much older, as demonstrated by a dirham which had been coined there in the name of Idrīs II in 198 H/813 AD (Laalaoui 1993). In addition, several late authors mention former historical moments of the city. As they explain past events, we need to be careful with these testimonies. Ibn Sa'īd al-Garnatī (late 13th) believes that the 'Apostles' founded the city (Fagnan 1924: 16-7). Ibn 'Iḏārī (1953-1954) (dead in 1312) says that it was populated by Christians when 'Uqba ibn Nāfī' besieged and conquered it, after entering into the western Maghreb in 68 H/681-82 AD. He also dates the construction of a mosque in Aġmāt Aylān (Ibn 'Iḏārī 1954: 38-9) in the 85 H/704 AD. In his *Book of Qibla*, al-Masmūdī (14th century AD) dates the construction of the *minbar* of Aġmāt Aylān in 80 H/700 AD and the erection of the mosque of Aġmāt Aylān by a client of the Umayyads from Cordoba in 245 H/ 859 AD (Rius 2000: 294-5).

The foundation of Marrakesh in 1069 (Lévi-Provençal 1957) by the Almoravids did not ruin Aġmāt and the city remained active and prosperous under the rule of the Almohads, while its role as a spiritual centre grew (Ibn Zayyāt al-Tādilī 1995). Aġmāt Aylān disappears from the written sources further on, but it was not until the end of the Marinid dynasty when Aġmāt Ūrīka started suffering a real and rapid decline, losing, first, its urban character and leaving room for a settlement of modest farmhouses in the surroundings of Marrakech.

Summarizing this heterogeneous data, we can admit that the foundation of Aġmāt took place around the 800 AD, before the coining of the Idrīs II *dirham*, or maybe a little earlier. Until the 1500 AD, the process of growth and transformation of the city and the surrounding landscape -which is the topic of this research, had probably lasted seven centuries.

The landscape of Aġmāt seen by the Arab authors (9th-16th AD)

As far as we are aware, al-Ya'qūbī is the first contemporary author to refer to the agro-livestock Aġmāt wealth, but his references are still very vague, 'a region called Aġmāt, a fertile country, rich in pastures and field crops' (al-Ya'qūbī 1962: 31; Arabic: 30). This little quote is not enough to come to a conclusion about the irrigation methods used to reach prosperity. This source of information, however, is not disregarded and may be the most plausible hypothesis if we follow the arguments relating to the whole Maġrib al-Aqṣà, discussed on other occasions (Cressier, Méouak 1998).

More than a century later, al-Bakrī (1014-1094) indicates that: 'In the surroundings (of Aġmāt), there are numerous gardens/orchards (*baṣātīn*) and palm trees' (al-Bakrī 1965: 291-2). Although it is not explicit, this information is much more accurate in the previous paragraph because, under the local edaphologic conditions, it would not have been possible to maintain gardens/orchards and palm trees without irrigation. Moreover, if this type of irrigation was already working by the time the author al-Bakrī had written it, we should assume that it had been established a few generations

[2] Or Warīka, depending on the authors.
[3] Or Iyllān, Illān, Waylā or Haylāna, depending on the authors.

Figure 3. Current state of the tomb of 'Abd Allāh, the last ziri king of Granada (r. 1073-1090), exiled by the Almoravids in Aġmāt (Photo J. Lirola Delgado).

before. The author adds more data about the presence of water in Aġmāt, as we will see later on.

In his *Kitāb al-Ğuġrāfiyya* (1137), al-Zuhrī only observes that in Aġmāt there are 'many fruits, vines, cereals and millet or sorghum' (Arié 1991: 661; Bramón 1991: 53). Al-Idrīsī (1100-1166) is far more loquacious: 'The city Aġmāt Ūrīka was raised [...] in the midst of a wide plain; her arable land is excellent and it is covered with vegetation; it is crossed by streams flowing in all directions. Around the city, there are gardens/orchards surrounded by walls and thick orchards trees [...]. A small quiet river crosses the city, taking its waters towards the north. There are wheat mills on the river and its waters entered the city on Thursdays, Fridays, Saturdays and Sundays; on the remaining days, they are diverted to irrigate the fields and orchards' (al-Idrīsī 1983: 74). We cannot take the description of al-Idrīsī literally, because it is hard to fathom that the city was left without services for three days a week. We must retain, on the one hand, this first mention of a regulated water distribution that met the needs of city dwellers and farmers in their immediate environment (who could be the same inhabitants).

Later authors are quietly imprecise, although all of them implicitly or explicitly refer to an agricultural irrigation landscape. Waṭwāṭ (1235-1318) tells us 'there are orchards and numerous palm trees' (Fagnan 1924: 48.), -with the water requirements of these trees-, and for al-'Umarī (1300-1384) 'it is a real water reservoir, a tree and splendid fruit warehouse'.[4] Contemporary to the latter, Ibn al-Wardī does not contribute more: 'There are numerous trees, grasslands, fruits and plants.'

Ibn al-Ḫaṭīb (1313-1374) was in Aġmāt personally to visit the tombs of the Taifa emirs of Seville and Granada (Figure 3), who died there during their exile by the Almoravids more than two centuries before, a fact that gives his testimony a special value. As usual, he boasts lyrically about the city: '[...] it is famous for its beauty. It is a paradise, beneath which rivers flow, a bouquet of flowers that gives off a delicious aroma. It has many orchards and the olive trees form an immense ocean. It produces a lot of fruit and, especially, figs and grapes. Its countryside, a wide grassland, is full of streams which water the land' and 'The water of the river is useful not only for Aġmāt but also for the *qariya*-s surrounding it'(Ibn al-Ḫaṭīb 1977: 152-4), an observation that confirms the case of al-Idrīsī.

[4] He also specifies the annual amount of taxes paid by Aġmāt: 25 000 dinars, which places it among the medium-sized cities (Fagnan 1924: 76; al-'Umarī 1927: 171).

From the fifteenth century on, Aġmāt probably loses its urban features but maintains its wild nature environment. According to al-Wazzān, known in Europe as Leo Africanus (1490-1550), '[Aġmāt] is surrounded by rich orchards and vines' (Léon l'Africain 1956: 108). Although, as we will see later on, the archaeological approach will give us the key to the overall interpretation of the construction of the irrigated landscape of Aġmāt, the figures we have just discussed allow us to give some preliminary steps around three main points: the source of water, the time when the practice of irrigation started, and the conditions of sharing between country and city.

According to several Arab authors, a river (*wādī*) or a watercourse (*nahr*) crossed the city from south to north. We obviously know it was not the *wādī* Ūrīka, -and not only because none of these authors identify it as such. Indeed, the urban area is perfectly located and this *wādī* runs further east, and we have found no geomorphic evidence about the modification of its main watercourse in the glacis, at least over historic times. In addition, violent seasonal floods of this kind of river located at the foothills will have unnecessarily exposed the buildings to the risk of destruction. Al-Bakrī is the only geographer (along with Waṭwāṭ, which merely copies him) who gives us more information, '[In Aġmāt], there was a small brackish river flowing from south to north; it was called Tagīrūt'.[5] However, this information contains a contradiction: if the direction of this watercourse is the same as indicated in other sources, and is due to the local topography, it is also clear that the brackish water is not suitable for irrigation, a practice in which however there is almost unanimity. In his comprehensive study about the *Ḥawz* of Marrakech, P. Pascon tried to find an explanation identifying the salty stream with the *wādī* Qayyī, an eastern affluent of the *wādī* Ūrīka (Pascon 1983: 35, no. 18), perhaps next to Aġmāt Aylān. We cannot exclude this possibility but it is surprising that al-Bakrī had been interested in a secondary element of the hydrological landscape unless he has mixed by mistake data from Aġmāt Ūrīka and Aġmāt Aylān, whose location remains unknown, but should be placed indeed on the right bank of the *wādī* Ūrīka. Excluding these natural resources, we can only conclude that the course crossing the city was artificial, an irrigation channel, which would logically come from the closest perennial *wādī*, the Ūrīka, from where the waters are derived.

We have seen that until al-Bakrī times, the Arab authors did not explicitly mention the practice of irrigation in Aġmāt and its countryside. But, in any case, this can't be taken as an *argumentum a silentio*, as all of them agree on the wealth of its agriculture, except Ibn Ḥawqal that prefers to focus on the business activity (Ibn Ḥawqal 1964: 79, 89, 98, 101). Therefore, we can assume as a preliminary hypothesis that the processes of urban foundation and construction of irrigated agricultural landscape could have been coetaneous, and we will find confirmation of this *a posteriori*, thanks to the archaeological survey.

The existence of a water-sharing, whatever the recipients are, -in this case, the field and the city-, imposed an adapted hydraulic infrastructure. It is logical to think, on the one hand, in a division of the main ditch, which ran across the village centre, or either in the functioning of several irrigation channels with their own derivations on the river.

Let's see now how the archaeological approach will allow us, thanks to the observation of the current state of the land parcels and the water network as well as the preserved remains of the medieval city, to go beyond the reconstruction of the transformation process of the landscape which led the foundation and subsequent development of Aġmāt.

Archaeological approach. Data and interpretations

The landscape we can observe today (Figure 4) is inherited from the medieval one and, at least, it is debtor of the technical structure established at that time -the distribution network of the water-, its study and therefore a better understanding of the current agro system of the orchard of Aġmāt (Bertrand and Bertrand 1975: 36-59) (Figures 2, 4, 5), would allow, a partial reconstruction, of the medieval agrarian system of the *ḥawz* of the city.

In order to achieve this aim, we conducted an agrarian morphology analysis by cartography and photo interpretation and we also conduct surveys *in situ* that allowed us integrating the monuments and the reconstruction of the layout of the channels in the morphological hypotheses previously considered.

1. Analysis of the agrarian morphology by cartography and photo interpretation (before the field mission, June 1997): understanding of the dominant lines of the parcel and emission of the hypotheses concerning its genesis and organization.

2. Surveys:
   a) Topography of the old mills and other hydraulic structures (hydraulic concrete) and more recent (*ṭābiya*) (Figure 6) in the layout of the ditches obviously linked to the medieval town centre of Aġmāt (Tawalt, Tasulṭānt Qbīla and Šibāniyya).

[5] Al-Bakrī 1965: 292. Nowadays, the hydronym Tagīrūt is unknown.

Figure 4. Aerial scene of the parcel around Aġmāt Ūrīka (© Google Earth 8.1.2015).

b) The absence of an area mapping at a sufficiently detailed scale[6] commanded to set up a survey, which, along with the cartography photo-interpretation and the aerial photography, allowed us to establish a reliable mapping of the principal *sāqiya*-s. The final result should enable us to integrate technical and social unity of the irrigated area in the analysis of agrarian morphology. We followed the route of the main *sāqiya*-s (ber.: *targa*-s) of the valley, from Aġmāt upstream of the Ūrīka *wādī*, and especially those that are deployed on the cone of the river (Tawalt, Tasulṭānt Qbīla, Šibāniyya, Tamentaht, Tasulṭānt Maḫzin, Tawrikt, Tamesglit) to the derivation dam (ber.: *uggug*). We only paid attention to one of the secondary irrigation channels [*mesref* (ar.) *assaru* (ber.)], the assaru nu-Gadir of the Tawrikt *sāqiya*, which organizes the low area

[6] We had a 1:50.000 map of the National Geographic Institute (NH-29, XXIII-1c Tahannawt) as well as a 1:2.000 of the medieval settlement sector made by a professional surveyor in 1960 as a request of B. Rosenberger.

Figure 5. Ḥawz of Aġmāt and wādī Ūrīka (with diversion dam of one of the canals that irrigates it) from the eastern bank of the river (Photo R. González Villaescusa).

of Dahra Mjabt according to the dominant orientation (31º W-NG).

The reconstruction of the highlands of the *sāqiya*-s posed problems due to the shortage of points of reference, -habitat, mapped elements as *qubba*-s or cemeteries-, so in this area the path should be observed more carefully, although the accuracy is enough for our purpose.

Figure 6. Modern hydraulic mill installed on one of the main sāqiya-s of the ḥawz of Aġmāt (Photo R. González Villaescusa).

Finally, the journey to the final part from Aġmāt to the mouth, to a *wādī* or another channel, could not be carried out due to lack of time. Only Tasulṭānt Qbīla was followed up to 6 km from the northern boundary of the medieval city. However, we could rebuild this part of the layout as well as the other *sāqiya*-s thanks to the oral survey, verified by several informants, and also with the cartography and photo interpretation.

c) Monitoring and topography of some *ḫaṭṭāra*-s,[7] *saniya*-s,[8] *aġrur*-s[9] and simple wells. Understanding of its functioning and relative location compared to other systems.

d) Oral survey for the understanding of technical and legal irrigation system (shifts, land and water propriety), and of the mills still working along the route.

The land parcels (Figures 4, 7)

The morphological analysis of the mapping and aerial photography of the zone had revealed the existence of a strong regularity of the land parcels. In the space between the *fūm*[10] of the river, up to Aḫliğ-Ūrīka, and the fields located in the north of Aġmāt on the one side, and between the left bank of the river to the road from Marrakesh, on the other side, this land parcels is

[7] Sub-horizontal drainage galleries of the aquifer.
[8] 'Blood' waterwheel (circular animal traction).
[9] Well with linear ramp for animal traction.
[10] '[...] les *foum*-s [*fûm* in arabic = mouth; in berber *imi* as in *imi n'Zat*, *imi n'Tanout*] ; it is to say, at the mouth of a river in a plain land' (Pascon 1983: 87).

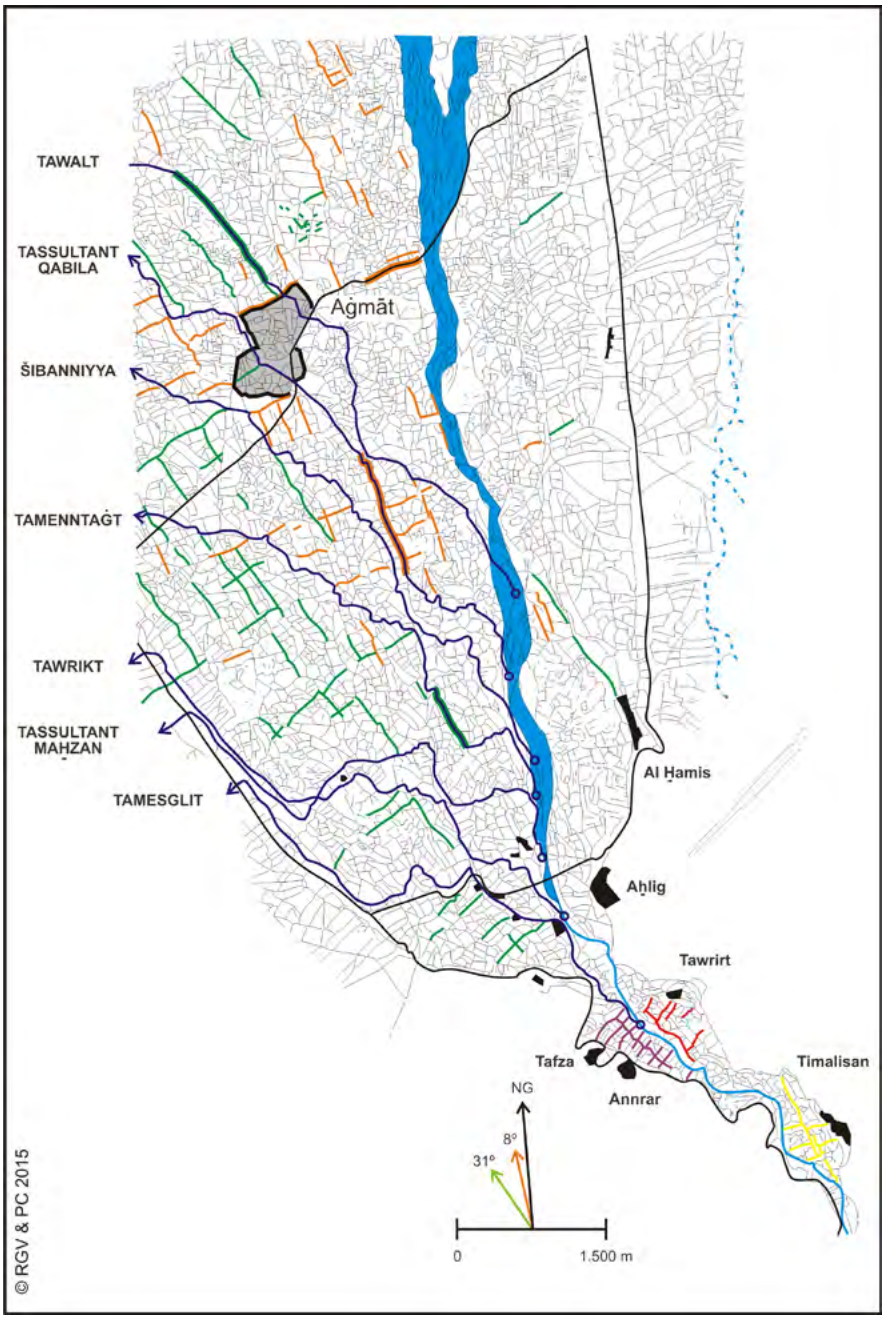

Figure 7. Morphological analysis of the current parcel around Aġmāt Ūrīka.

organized according to two dominant orientations (NG-31ºW and NG-8ºW) imposed in two different sectors. The second orientation prevails between the fluvial terrace of the riverbed and the *haǧeb* (ridge); while the first prevails between it and the rim of the valley along which the road runs. This regularity of the land parcels reminds us of other urban gardens of the al-Andalus (Valencia, Murcia...).

We tried, among other issues, to clarify if the organizational structure of such a vast space was the work of a single operation of surveying, perhaps linked to the city of Aġmāt or to other centralized power, or, on the contrary, if it was the result of the footprint of the agricultural activity in different communities spread over the valley. These issues concerns all organic regularities observed in similar systems (González Villaescusa 1996: 159), for example, the coherent parcel of the early history of societies, which didn't have a unifying central power. However, we could, in this case, relate this concept to the one P. Pascon provided in the '*géométrie de l'espace naturel*' (Pascon 1983: 8.) which, in turn, would determine the organic parcel regularity. Certainly, we are far from solving such a big problem, but we can provide some elements of response in the case of the *ḥawz* of Aġmāt.

The orientation of the *sāqiya*-s coincides only partially with the outlines of the parcel. When they reach the less rugged part of the Ūrīka cone, approximately from Aġmāt towards the northwest-, the orientation is the same as the perpendicular curves of the contour (~

31º W) and, therefore, with one of the two dominant directions. However, the intermediary structures, the secondary irrigation channels, are the ones that organize the parcel following this direction and not the main channels. We can explain this fact due to the technical limitations of their construction, which, along with topography, determine the morphology of the hydraulic networks. P. Pascon showed that the traditional technique had stopped builders from obtaining a wider irrigated area, within the possible limits of gravity irrigation (Pascon 1983: 93). If they had had modern technical knowledge, the layout of the *sāqiya*-s would have been almost parallel to the curves of the level, without losing the possibility of watering. The traditional technique generates a smaller space but, on the contrary, it creates a bigger slope of the channels that allows irrigation, while there is still some water remaining, even during the worst seasons of drought.

Consequently, their layout is oblique relating to the curves of the level because the goal of the main structure, the mother *sāqiya*, is to lead the water down to the end of the perimeter; gaining slope, when necessary, to overcome the adverse topography. Strictly speaking, this mother *sāqiya* doesn't organize the parcel morphology; the secondary channels do. One of them, the assaru nu-Gadir, and the plots around it are a good example of this. Consequently, the two identified orientations dominate in different topographical sectors.

The water network. Sāqiya-s and ḫaṭṭāra-s (Figure 8)

Identification and description

The cartographic identification is not easy and the names transmitted by the informers are unclear. Each *sāqiya* has several names depending on the knowledge of the reporter and on the place they are located, at the head or in the middle of the channel. If we add the errors on the topographic maps and different spellings in the transcriptions of the available maps and bibliography, the confusion is even greater.

Following the north-south direction, the order is as follows.

Tawalt

It doesn't appear on the map 1:50.000. It is mentioned by P. Pascon, whose diversion dam he locates on the border -established in an unknown time- between the tribal groups Ūrīka and Misfīwa (Pascon 1983: 157). Its layout is old as demonstrated by the remains that can be found along its way through the northern margin of the former medieval town.

Tasulṭānt Qbīla

This channel does not appear on the map either, 1:50.000. It is the most complicated to identify along with the Tasulṭānt Maḫzin due to the partial duplication of names. Local people call it Tasulṭānt, but when we asked them: 'is it also called Qbīla?' They answer affirmatively. This distinction may have been originated during the existing time delay between the constructions of each one. In one case, the reference to the Sultan is associated with the tribe, and on the other with the state apparatus. Tasulṭānt Qbīla runs across the city of Aġmāt diagonally from the southeast to northwest points and retains several remains of medieval structures in its path (Figure 9). If we admit that this is the watercourse called 'Tagīrūt' by al-Bakrī[11] it could probably be the *sāqiya* called 'Tar'rit' by E. Doutté in the early twentieth century (Doutté 1914: 30).

Šibāniyya

It appears in the cartography 1:50.000 as 'Soltane', although the photo interpreter who did the study mixed its top end with that of the Tasulṭānt Qbīla, erroneously building a single *sāqiya*. This can be explained by their similar layout in their upper part height, and because they run parallel for several kilometres. Its name could be translated as 'old', although it is also called *targa n-Uglid* (*tamaziġ*: 'channel of the King'), which adds a new confusion, this time with the two *sāqiya*-s Tasulṭānt. Its irrigated perimeter covers an area of 1 115 ha or about 11 km^2.

Tamentaht

This is the only name given to this *sāqiya* both in the mapping and in the bibliography. This main channel and those taking water further up the river are the ones who continue to bring the water from the month of August onwards, due to the privileged position of their dam, in the *fūm*. Their irrigated perimeter covers an area of 1 570 ha or about 15,7 km^2.

Tasulṭānt Maḫzin

It appears in the mapping identified as 'Tassoultannte'. It is probable the one that P. Pascon names 'Tassoultant-Ourika'[12] or even 'Sultâniya' (Pascon 1983: 170, no. 30). The local people call it by the simple translation Tasulṭānt-État' or even another: 'Rumiya' (a term that

[11] Al-Bakrī 1965: 292. We have seen that it was a brackish source of water for this author.

[12] Pascon 1983: 98-99 and 136. The schematic plans presented by this author show that 'Tassoultant' is also the name of a nearby area of Marrakesh watered by three *sāqiya*-s Tasulṭānt: 'Tassoultant ancienne' (or our Tasulṭānt Qbīla or Tasulṭānt Maḫzin?), 'Lakhaznia' or 'Nouvelle Tassoultant' (Is it our Tasulṭānt Maḫzin or a modern channel?) both from the *wādī* Ūrīka and 'Tassoultant Nfis' from the *wādī* Nfis. The total area of irrigated land would be 6 700 ha.

refers to Christians or Europeans), '[...] because they [re] constructed it under the French protectorate' contrary to the traditional or native one. In Murcia there is another canal called Rumía, a secondary irrigation channel of the Alquibla ditch (Torres Fontes 1971: 33). The second name, 'State', probably has to do with the fate of its waters: the Agdal in Marrakesh; indeed, the actual watering gardens created by the Almohad caliph and, therefore, its construction was due to a decision taken by the State (Figure 10). It could be the only territory in Aġmāt to have an exact dating thanks to the written sources.

But some confusion arises when we read information in the work of P. Pascon about a document concerning '[...] the crossing of the Sultania ditch around the year 1850' (Pascon 1983: 91). Should it be understood, as the author affirms a few lines above that it is a '*[...] remise en* état *des grandes séguias du Haouz par Moulay Abderrahmane*'? The waters of this *sāqiya* had been diverted by the Misfīwa in the second half of the eighteenth century (Pascon 1983: 170) and, later on, in the mid-nineteenth century, they are diverted again to head towards the Agdal. How much is left, among all these changes, of the medieval layout?

Tawrikt

Only denomination to which we had access. It seems that the only *sāqiya* which has an explicit tribal designation (the Ūrīka, one of the two founding groups of the city of Aġmāt). The reporter who showed us the operation of a mill next to Takatert said it had been rebuilt in concrete between 1977 and 1978.

Tamesglit

It is a partially derived ditch from the *wādī* Ūrīka far upstream, up to Tafza, but deploys its network of secondary channels in the valley. Due to the lack of time we could not follow the path of the other one, called Tarhumt, which derives much higher up the river and still leads its water to a small portion of *fūm*.

The layout between the diversion dam and the first fluvial terrace (haǧeb)

All the *sāqiya*-s that were prospected have now the diversion dam made in modern concrete and we can perceive even different stages in this material due to its gradual destruction by river floods and subsequent reconstruction. Still, in some places, the water is diverted through simple accumulations of stones, river pebbles and plastics (Figures 5 and 11). These stone dams are the ones we can still see in the irrigation systems of the valley of the *wādī* Nfīs, in the Tinmal area, or the high Ūrīka valley, and they should correspond also to the original systems of the area of Aġmāt.

The four *sāqiya*-s downstream, which were the subject of a more careful monitoring, -Tawalt, Tasulṭānt Qbīla, Šibāniyya and Tamentaht-, show great similarities in their layout. They are simply dug into the substrate, formed in this part of the valley by significant gravel surfaces, as we pass the first kilometres from the outlet, its layout begins to make a series of zigzags which are used to slow down the speed caused by strong slopes (Pascon 1983: 84). The variation in altitude along the *sāqiya* Šibāniyya is significant: its catchment is located 835 m above sea level, and in 2 500 m it drops down to 805 m asl, it is to say, a 30 m slope and an average gradient of 1,2% but less than the average along its route (3%) (Pascon 1983: 84).

The layout of the *sāqiya*-s shows great similarities because it tries to overcome similar gradients, but in different parts of the valley. All of them run through the initial part in the same general direction of the slope, until they have to overcome the first level of the slope. They previously form a right angle to be at the same height they will run for a while, before passing through the *haǧeb*. This is the reason why the path between the Tasulṭānt Qbīla and Šibāniyya, which are close to each other, is almost identical. They use the same logic in their technical solution, and that is what makes the canals converge on two small sectors: the rim of the cone, down the road from Marrakesh and the flange of the first terrace, the *haǧeb*, at the height of Sidi Bou Qnadel. In this second sector, the distances between Tasulṭānt Qbīla, Šibāniyya and Tamentaht are less than 30 m. Moreover, between Tasulṭānt Qbīla and Šibāniyya there are only 6 m. In the upper and unproductive section of the *sāqiya*-s, between the outlet and the foot of the *haǧeb*, no irrigation is practised and the land is mainly dedicated to pasture, as we find small herds of sheep and few cows grazing. At the foot of the *haǧeb*, we can find the first cereal fields and olive trees, in the lower part we find some of the first orchards and the earliest human settlements.

The layout downstream from the haǧeb until Aġmāt (Figure 8)

The layout of the Tasulṭānt Maḫzin shows how the upstream *sāqiya*-s go out of the valley creating many irrigated fields. The *mesref* or secondary irrigation channels run and organize the agricultural area with great regularity. The most significant example is the assaru nu-Gadir and the fields that are organized in parallel with it, which correspond to the orientation NG-31º W.

Concerning the low *sāqiya*-s, once they flank the *haǧeb* up to Sidi Bou Qnadel, they water a plain cultivated and frequently irrigated (Pascon 1983: 162). The *huerta* surrounding Aġmāt is located in this plain (Figures 2, 4 and 5). The grounds are occupied by numerous orchards irrigated not only by the waters of the *sāqiya*-s but also

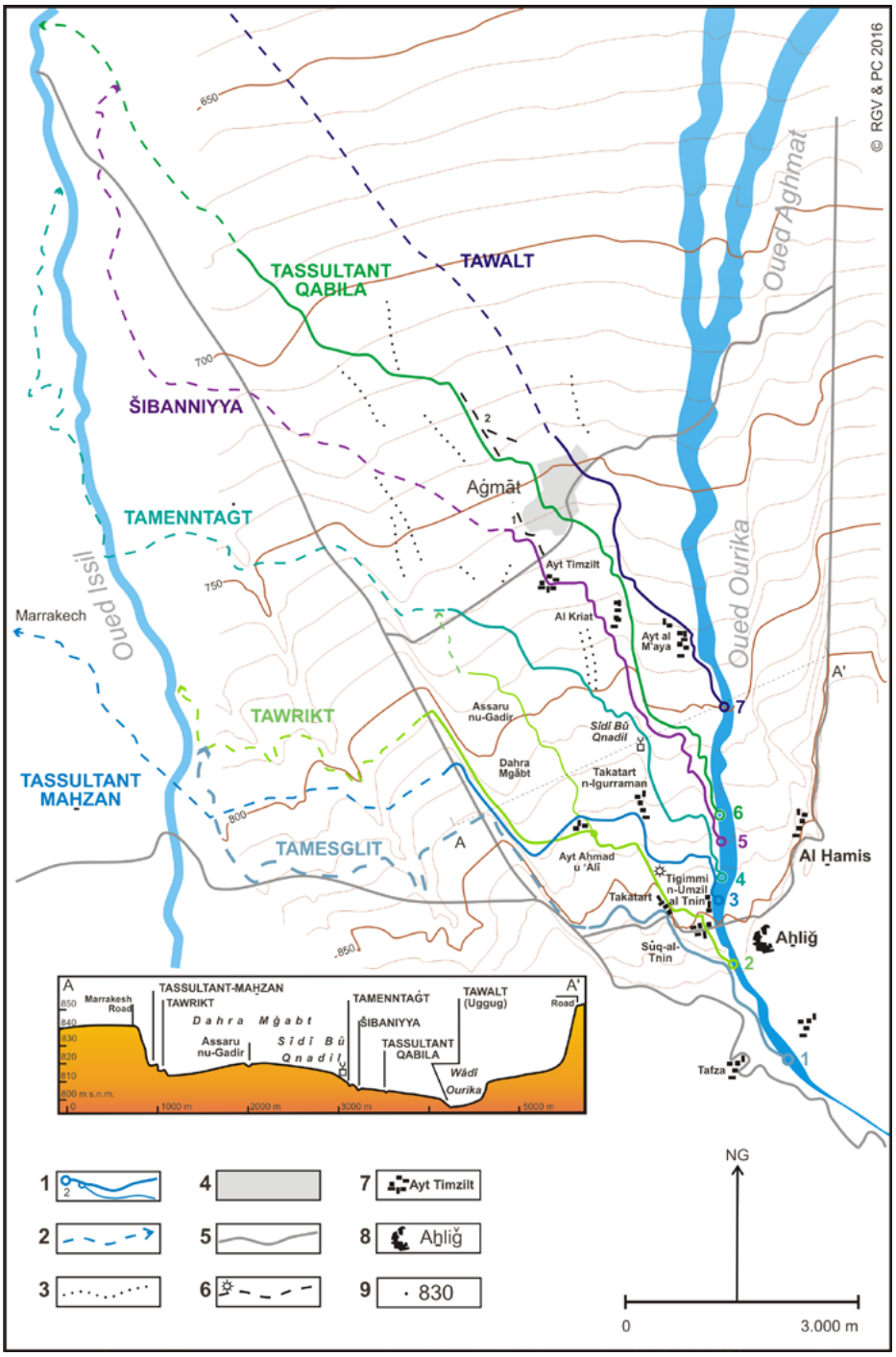

Figure 8. Interpretation of the hydraulic system of the ḥawz of Aġmāt by photo interpretation and surveys. Legend: 1. Hydraulic network with secondary leads analyzed by photo-interpretation and confirmed in prospecting. 2. Hydraulic system Identified by photo interpretation and confirmed by oral information. 3. Ḫaṭṭāra-s interpreted on aerial photography. 4. Aġmāt medieval City. 5. Ḫaṭṭāra-s prospected, mills. 6. Habitat. 7. Agglomeration. 8. High above sea level.

with wells and *ḫaṭṭāra*-s that are becoming numerous in this area (Figure 12). The water table is located between 20 and 10 m depth (Pascon 1983: 111-112) from which the water is drawn for irrigation, complementarily to the water network from the *wādī* Ūrīka.

The reddish brown soils of sandy-loam texture (Pascon 1983: 79) reach the highest depth in this sector, as we can see, for example, in the archaeological excavation held in Aġmāt, or in the cuts generated by the riverbeds of the *sāqiya*-s. They contrast with the grey sand deposits, completely peculiar for the edaphologic nature of the terrain, and descending from the Atlas, dragged by the *wādī* Ūrīka and dispersed by the water network. The maintenance works of the channels, which we saw in the Tawalt sector, eliminate these sedimentary deposits, which serve as raw materials for construction.

In this area, the monitoring of the *ḫaṭṭāra* of douar Idrourhane has been noteworthy. We found it important for our analysis due to the morphological relationship with the medieval wall. The alignment of its wells surrounds the walls until it reaches the same height, establishing a relative chronological element with a medieval structure from which it is more recent. This would result in the phenomenon observed by

P. Pascon in the *Ḥawz*: the 'individual' systems-small *ḫaṭṭāra*-s, *saniya*-s and other wells- are later to the *sāqiya*-s network because they are developed with the smallholdings exploited directly, regardless of the structure of collective management (Pascon 1983: 113-116). This process of 'densification' is also well known in the Iberian Peninsula where it can be linked, in some cases, to the changes caused by the Christian 'Reconquista' (Cressier 1995).

The final layout of the sāqiya-s

The only *sāqiya* which was followed downstream from Aġmāt is the Tasulṭānt Qbīla. It follows the route from the walls of the barren city to the *wādī* Issil, converging with the final section of the Šibāniyya just before the confluence with the *wādī*. As we have already mentioned, the end part of the *sāqiya* -s has been rebuilt with the help of cartographic and photographic documents, assisted by the oral information.

Along the six kilometers we follow the Tasulṭānt Qbīla, we found that, outside the medieval town center, there are less abundant orchards, but, on the other hand, we find more cereal crops and olive trees, watered only scarcely. At the time of the survey, the water still present in the head of the *sāqiya*, no longer came to town. This allowed us to appreciate the shallowness of the channel bottom, less than 70 cm, finding the *sāqiya* carved in a substrate of gravel and stones under the brown soil. This substrate may be related to the deposits of the recent quaternary of the cone of the *wādī* Ūrīka (Pascon 1983: 39-40).

Along the way, we could follow the parallel paths of a *ḫaṭṭāra* and one of the branches of the *sāqiya* visible in the aerial photography. The difference from the other *ḫaṭṭāra*-s we had followed was at the end of the aerial part of the conduction; the water coming from the aquifer was mixed with the bypass channel of the river course (although it was dry at that time). A few meters ahead, a derivation of the largest *sāqiya*, supplied a pool dug into the soil and only partially built: the regulator for the water outlet.

The end of the *sāqiya*-s follows the usual methodology of pouring the water in a *wādī* -in this case the Issil- or possibly in the channel located immediately downstream -the Šibāniyya, for example, leads to the Tasulṭānt Qbīla – and it closes the hydraulic perimeter as well as the technical and social unity that it generates.

Lessons from the ruins of Aġmāt Ūrīka

We do not pretend to present all the monumental remains of the city of Aġmāt Ūrīka, but only the evidence that these can provide us to understand better the medieval hydraulic system and especially to clarify its chronology.

Figure 9. Remains of a medieval channel bypass sāqiya Tasulṭānt Qbīla, and the mill it supplied, in the town center of Aġmāt Ūrīka (Photo P. Cressier).

Figure 10. The olive grove in the Buḥayra (nowadays Agdal), large recreational parcel of the Almohad Sultan in Marrakech, supplied by the Tasulṭānt Maḫzin sāqiya derived from the Ūrīka wādī upstream of Aġmāt. In the foreground, one of its two large water reservoirs. (Photo R. González Villaescusa).

Figure 11. Diversion dam of the Tasulṭānt Qbīla sāqiya taking water from Ūrīka wādī (Photo R. González Villaescusa).

The city was surrounded by a partly preserved outer wall (Figure 1), forming an irregular polygon, whose

Figure 12. Water outlet of one of the late ḥaṭṭāra-s dug into the medieval hydraulic network (Photo R. González Villaescusa).

Figure 13. The medieval urban area overcame the obstacle of the Tasulṭānt Qbīla sāqiya thanks to two arches made of stone masonry and brick which nowadays, in the modern village, serve as a bridge for pedestrians and light vehicles (Photo P. Cressier).

longest axes measure almost 1 000 m. Due to the absence of natural topographical anomalies which could have been the cause of this irregularity, we may interpret that the walls enclose a pre-established urban area. There must also have been another oval wall, on

Figure 14. Qubba of Sīdī Ya'qūb in the urban area of the ancient Aġmāt Ūrīka, surrounded by a secondary branch of the Tasulṭānt Qbīla sāqiya. (Photo P. Cressier).

the inside, which marked a much smaller space;[13] its design could be glimpsed in vertical aerial photographs from the 1970s, but the area is now fully urbanized. The axial channel (Tasulṭānt Qbīla) crosses both city walls below a double arch built in brick[14] (Figure 13); this sign -although it is not decisive- indicates that it was built later or at least it is contemporary to the channel. Another argument in favor of this relative chronology is that traversing an urban area already installed with this kind of channel (important width, reinforced by hydraulic concrete walls...), not previously planned, would have led to destroy many buildings. Such destructions have not been documented yet in recent years excavations in the *ḥammām*[15] neighborhood, which is crossed by this *sāqiya*.

[13] We cannot say, in the present state of our knowledge, if it was a walled enclosure built previously to the wider one, or if it had a different purpose, defining the central area of the city, its *qaṣaba*, never mentioned as such in the written sources (although we know by al-Bakrī -1965: 291- that the emir lived in Aġmāt Ūrīka).

[14] Both have been transformed nowadays in bridges for the transit of people and light vehicles.

[15] About this program, launched before we have finished our own researches, see for example: Ettahiri, Fili, Van Staëvel 2012; and Fili *et al.* 2013.

Some hydraulic structures (horizontal wheel mills -destroyed nowadays-, with its canals diverting from the main course) (Figure 9) or monuments (funeral *qubba*-s, some of them belonging to holy men mentioned in written sources of the 13th AD[16] (Figure 14), may have contributed to the fossilization of the hydraulic network route as a whole. More excavations would be necessary to confirm this interpretation.

We can make similar observations about the *sāqiya*, which is located immediately in the north of Tasulṭānt Qbīla, *sāqiya* Tawalt, although we have less archaeological data about it because its urban path is much shorter. As regards the channel located upstream of Tasulṭānt Qbīla, its name (*sāqiya* Šibāniyya) indicates its age, but to the southwest its outline remains at a certain distance from the wall, which makes us think that it could be medieval but more recent than the proper urban implementation.

A global interpretation

Data from the morphological analysis of the land parcels, obtained from cartography and photo interpretation and complemented by field observations converge with the analysis of the water network associated to the study of the medieval remains inventoried. All together, they let us propose an interpretation of the evolution of the agricultural landscape of Aġmāt throughout the Middle Ages.

Upstream of the *fūm* ,[17] the irrigation perimeters of the bottom of the valley follow a similar structure to all of the numerous case studies on the Iberian Peninsula dating from the Andalusian period as well as those of the northern territories of Morocco (for example, some of the pattern associated with the medieval city of Nakūr, or the most modest of Taġssa further west (González Villaescusa 2002: 347-352; Carbonero, Cressier, Erbati 1997): the route of the *sāqiya* surrounds the field crops that generate a regular shape and the habitat lies above it. We have no elements to date these small ensembles, with no clear connection to the wide range of channels that cross the field downstream of the *fūm* and -those are- spatially and functionally linked with the medieval urban settlement, as we will see.

Several studies carried out in al-Andalus show that, when it is necessary to expand an irrigated area and the hydraulic network that gives life to it, bypassing the river, the seemingly convenient solution, consisting of extending the channels, is not the most effective, because it doesn't allow to increase the water flow. Much better, then, it is to multiply the outlet of this river (Cressier 1995; Cressier and Osuna Vargas 2005; Cressier 2006). In this case it is easier to perform this extension of the irrigated area upstream than downstream. Extending downstream (except if we do it at a sufficient distance, of course) implies that the new channels have to go through an existing land parcels which will have to adapt or modify the ordination, which would be costly and complex. Expanding it upstream, however, allows new *sāqiya*-s to wrap the parcel without disturbing the existing one. Obviously, as such an extension increases the risk of decreasing the river flow downstream, the process assumes that the populations concerned have come to an agreement (or the newly established above impose this solution by force).

Two decisive evidences clearly show that the irrigated land by the *sāqiya*-s of the alluvial cone of Aġmāt have followed this process of growth: the *sāqiya* explicitly mentioned by al-Bakrī (11th AD but probably collecting information of the previous century), that was crossing the city cannot be other than the Tasulṭānt Qbīla, which still crosses the field of ruins and keeps the remains of the medieval hydraulic constructions. While Tasulṭānt Maḫzin, which we suppose was traced by the Almohad Sultan (12th)[18] to supply the large estate of al-Buḥayra/ Agdal, derives the *wādī* further above and, using siphons and small aqueducts, it must indeed overcome the obstacles that other channels present.

We can therefore now reconstruct the chronology of the whole process. Tawalt and Tasulṭānt Qbīla, whose dams are located more to the north, are the oldest *sāqiya*-s (9th AD?), contemporary, nearly certainly, to the founding of the city (among other reasons because its route does not seem to have destroyed any previous urban area). The association of the terms 'Qbīla' and 'Tasulṭānt' might remember the tribal authority that also presided the creation of the city, or rather one of its two components, Aġmāt Ūrīka.

Šibāniyya, whose name must refer to its ancient origin, could be contemporary, or a little later by the fact that its design seems imposed by the western section of the town wall.

Tamentaht and Tawrikt – tribal name related to the founding tribe of the city – were built later than Šibāniyya, because they are already installed when the Tasulṭānt Maḫzin[19] has to overcome their courses to reach Marrakech. If Tasulṭānt Maḫzin dates from the 12th century, they are certainly medieval and slightly

[16] For example Sīdī Ya'qūb, in al-Tādilī (1995: maybe number 147).
[17] Outside the image 2.

[18] The construction initiated by 'Abd al-Mu'min may have been completed by his son and successor Abū Ya'qūb Yūsuf: El Faiz 1996: 8.
[19] We have said that this *sāqiya* has a special status because, as assumed still by the local population, the water cannot be used along its route (adjacent fields that belong to the social unit of Tawrikt) except for human or animal use, or as a driving force in mills.

later (Merinid?). If it is modern, then the elapsed time between their respective constructions may be longer.[20]

Upstream, Tamesglit could have been, at a time we cannot say for now, the last stage of the building process of the *sāqiya*-s network of the *ḥawz* of Aġmāt.

Only the *ḫaṭṭāra*-s inserted into this network and land parcels of medieval origin would be more recent. Using a different technique, based on the exploitation of the underlying aquifer, they can supplement local water resources, particularly in time of drought.

Indeed, if today Tamesglit, Tawrikt and perhaps Tamentaht keep the water even during the dry season because their dams are next to the *fūm*, the *sāqiya*-s derived downstream in the *wādī* Ūrīka find it more difficult, as we saw in 1997. This confirms a worsening that could have started with the imposition of the Tasulṭānt Maḫzin in the pre-established hydraulic network,[21] but it could have been realized in modern times – the medieval sources do not evoke this problem about the channel crossing the city- with a weather evolution towards greater summer droughts, exacerbated by massive deforestation of the surrounding mountains.

It seems, then, that urban foundation and construction of an irrigated agricultural area have been, in the case of Aġmāt, the components of a single initial process, that lasted for two or three stages.

The simultaneity of the urban foundation and the construction of an associated hydraulic system now seems to be a widespread process in the case of West Maghrebian cities created *ex nihilo* in high Middle Age (Cressier 2018: 325-328).

We have already noted that the imprint of the parcel regularly, that we can notice from the *fūm* across the area of the *wādī* Ūrīka cone, raises a fundamental question: Is it the work of a single operation of space colonization and surveying? Could it be linked therefore to a centralized authority?

The scientific literature about this subject tends to show that, when a surveying operation is identified with a dominant orientation, this is usually built on the ground using roads, big axes on which we can base the surveying. In the present case, in aerial photography we can see some alignments, but they are not long lines, they are only small segments within the orientation. On the ground, these axes correspond to constant guidance roads which are really tortuous, for example the ones bordering the assaru nu-Gadir. It is impossible to admit that they have been drawn in a straight line. The appearance of different topographical sectors with different orientation leads to the same hypothesis. In this case, we think that the 'organic regularity' responds to a gradual construction of the agricultural area, which is subjected to a topographic constraint, the 'natural geometry' of the land (Pascon 1983: 8).

However, we do not find any contradictions in these observations. The hypothesis often adopted in which an operation of surveying usually involves an orthogonal structure of space and cannot occur more than under the control of a centralized power, a strong State -following the example of the romans centuriation's- is not necessarily the only possible one. In the case of Aġmāt, a city founded under the agreement between two tribes (Ūrīka and Aylān) and governed at first by at least one power chosen among the nobility of these groups,[22] it is perfectly permissible to have acted more pragmatically and technically more logical, paying attention to the conditions imposed by the natural topography of the surrounding area.

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[20] Violaine Héritier-Salama, who takes up the question of the practice of irrigation in Aġmāt as part of a PhD directed by F. Wateau (Paris 10 University), considers the hypothesis of a construction in very recent times as the most likely (personal communication, july 2018).

[21] It generated conflicts over the following centuries, on the one hand, between the tribal groups of the area and the central power each time it seemed weak, and moreover between the Ūrīka and the Misfiwa, a tribe that was expanding progressively to the south.

[22] Al-Bakrī 1965: 292: 'Formerly, the inhabitants shared the role of the emir; the person who had assumed the role for one year was replaced by another elected by the people. It was always a peaceful agreement'.

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Mediterranean Landscapes in Post Antiquity: New frontiers and new perspectives highlights the fact that the study of landscape has in recent years been a field for considerable analytical archaeological experimentation. This new situation has made it possible to rethink the orientation of some theoretical approaches to the subject; equally these methods have been profitably used for the formation of a new theoretical and conceptual framework. These analytical trends have also featured in the Mediterranean area. Although the Mediterranean is the home of classicism (which also defines a particular archaeological methodology), it has seen the implementation of projects of this new kind, and in regions of Spain and Italy, after some delay, the proliferation of landscape archaeology studies. There are examples of more-or-less sophisticated post-colonial archaeological work, albeit conducted at the same time as examples of unreconstructed colonial archaeology. It is not easy to resolve a situation like this which requires the full integration of the different national archaeological cultures into a truly global forum. But some reflection on the cultural differences between the various landscape archaeologies, at least in the West is required. These considerations have given rise to the idea of this book which examines these themes in the framework of the Mediterranean area.

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