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Mapping the Past

From sampling sites and landscapes to exploring the 'archaeological continuum'

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Michel Dabas, Stefano Campana
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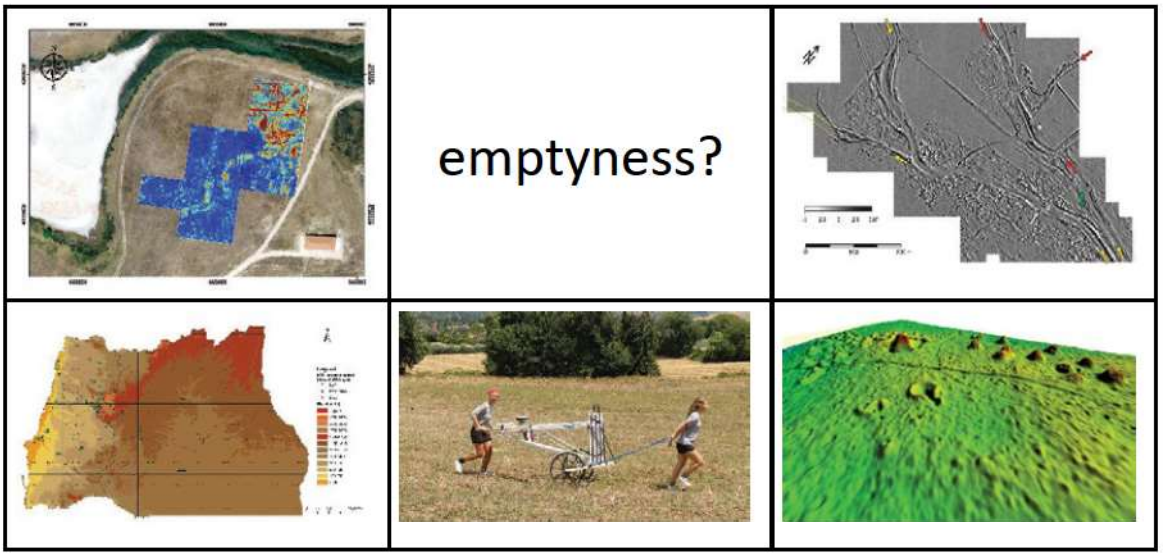

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Contents

A view from the hills. Investigating protohistoric phases in the longue durée of the Potenza Valley (Marche, Italy)

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Abstract

We present new research of protohistoric communities in Central-Adriatic Italy through non-invasive prospection of pre-Roman settlements and their catchments. We look beyond the well-known burial record of the indigenous Piceni groups in the present-day region of Marche, instead investigating the much less studied settlement patterns in the Bronze and Iron Age. We seek to place habitations and territorial behavior in the archaeological continuum, in both a diachronic and a spatial context. The diachronic aspect concerns adding time depth to the until now predominantly Roman and Late Antique research themes of the Potenza Valley Survey project (PVS, 2000-2017). The spatial continuum concerns our aim to fill in the blanks in the known protohistoric record through detailed research of habitation zones and productive catchments. We do this using mainly non-invasive prospection techniques. In this paper, we discuss our approach and its challenges, and present preliminary results and considerations of the fieldwork that was carried out at the site of Monte Franco (Pollenza).

Keywords: archaeological prospection, protohistory, micro-regional analysis, Italy

Résumé

Nous présentons une nouvelle recherche sur les communautés protohistoriques en Italie centrale-Adriatique par le biais d'une prospection non invasive de sites d'habitat pré-romains et de leur contexte territorial. Nous nous intéressons au-delà des sites funéraires bien connus des groupes autochtones Picènes dans la région actuelle des Marches et examinons plutôt les schémas d'établissement beaucoup moins étudiés de l'âge du bronze et du fer. Nous cherchons à situer les habitations et les comportements territoriaux dans le continuum archéologique, au sens diachronique et spatial. L'aspect diachronique concerne l'addition de la dimension temps aux thèmes de recherche à prédominance romaine et d'Antiquité tardive du projet Potenza Valley Survey (PVS, 2000-2017). Le continuum spatial concerne notre objectif de combler les lacunes du contexte protohistorique connu grâce à une recherche détaillée des zones d'habitation et des territoires productifs. Nous faisons cela en utilisant principalement des techniques de prospection non invasives. Dans cet article, nous discutons de notre approche et de ses défis, et présentons les résultats préliminaires et les considérations du travail de terrain sur le site d'étude de cas Monte Franco (Pollenza).

Mots-clés : prospection archéologique, protohistoire, analyse micro-régionale, Italie

1. Introduction

This paper presents a new phase in the long-term landscape-archaeological research of Ghent University in the Italian region Marche, focusing on the social organization of protohistoric communities as expressed by their spatial behavior in settlements and their catchments. The current FWO-funded 'Neighbours and Nobles' project aims at a better understanding of the poorly understood settlement record of local Bronze and Iron Age groups in Central-Adriatic Italy through the non-invasive prospection of micro-regions with habitations and their surroundings. The analysis and interpretation of the integrated data from geophysical surveys, fieldwalking surveys, aerial photography and topographical work gives new insights in the daily organization and territorial arrangements of pre-Roman groups; a valuable addition to the well-

Figure 1. View from Monte Pitino across the middle Potenza Valley (Marche, Italy) towards the Monte Franco-Pollenza ridge. Locations mentioned in the text are indicated.

known Iron Age burials of this part of Italy. Moreover, we use prospection data not only as a means to put dots on the map, but rather to analyze the arrangement of space as an expression of social norms. To this end, we have to look beyond the 'site' and instead focus on the wider habitus of these pre-Roman communities. This paper discusses the scientific and environmental background to our ongoing studies, our conceptual points of departure, the challenges to our approach, and first results of fieldwork at one of our case study areas: the Monte Franco near Passo di Treia (Figure 1).

2. The Potenza Valley Project

Since 2000, the landscape-archaeological Potenza Valley Survey (PVS) project of Ghent University investigates changing social complexity in the Adriatic valley of the river Potenza through the analysis of spatial patterns on the surface and in near-surface archaeological records (Vermeulen *et al.* 2017). The PVS has had a strong geo-archaeological focus from the beginning, using a multi-disciplinary toolkit to map, analyze, and understand the occurrence of archaeological traces in various situations. Accordingly, the project was initialized as a cooperation between the Departments of Archaeology and Geography, expressing a strong interest in understanding landscape formation processes in relation to the preservation and detectability of past human occupation traces. Moreover, the project had from its onset a strong methodological interest in developing approaches and techniques for the study of regional archaeological dynamics. This is expressed in the focus on testing and fine-tuning archaeological prospection techniques, including geophysical methods, aerial photography, remote sensing, field walking, and targeted coring.

The PVS surveys were executed at different resolutions: extensive surface surveys to obtain a general overview of land use dynamics through time, and intensive gridded surveys to map local distribution patterns and occupation trends. These surveys were followed by intensive site studies using geophysical techniques and aerial photography, the combination of which has proven very successful in mapping intra-site layouts of Roman-period centers including the abandoned towns of Potentia, Trea, Villa Ricina, and Septempeda. The magnetic gradiometry survey of the multi-period site Montarice near the coastal town of Porto Recanati demonstrated the potential for prospection of pre-Roman traces.

Figure 2. Prospection techniques applied in the 2018 fieldwork. From left to right: geophysical survey (ground penetrating radar), intensive artefact survey, manual augering, aerial photography / micro-topographical survey using drones.

The geo-archaeological approach and methodological interest of the PVS continues in the current Neighbours and Nobles sub-project (Figure 2). This study puts the spotlight on the protohistoric phases in Central Adriatic Italy, which have remained underexposed compared to occupation in the Roman and later periods. We are especially interested in assessing geophysical prospection techniques for the detection and interpretation of Bronze and Iron Age settlement and land use. There are still few (well-published) examples of geophysical surveys on pre-Roman sites in Italy as compared to the historical periods, despite an increase in geophysical prospection surveys in recent years. This may partly have to do with the popularity of ground penetrating radar (GPR) in archaeological prospection in Italy; a method which has proven its merits in the mapping of stone architectural remains such as the Roman cities of Interramna Lirenas and Falerii Novi (Verdonck *et al.* 2018), but which often produces far less eloquent data in non-monumental and ephemeral pre- and protohistoric contexts – and which are then, unfortunately, rarely published. From the outset of the current project, we therefore try to avoid such predispositions by testing several techniques available to us and evaluating their results in relation to soil and archaeological parameters. On the basis of the results of a previous magnetometry survey by Eastern Atlas at the coastal site of Montarice (Vermeulen *et al.* 2017: 55; De Neef and Ullrich in press), we hoped that this technique would be effective elsewhere in the valley.

3. Missing aspects of the archaeological continuum in Central-Adriatic Italy

Central-Adriatic Italy has been studied by several landscape-archaeological research projects, but this has not resulted in a well-balanced archaeological record. Pre-Roman settlement and land use remain underrepresented themes despite a recent revival in studies of the Iron Age *Piceni* populations in which the local heritage authorities take an active role. Although a growing number of pre- and protohistoric sites are being investigated (for instance the current research at Belmonte Piceno by the University of Freiburg (Germany), Monte Croce Guardia (Cardarelli *et al.* 2017), Miralbello, Serra de' Conti, and the recently discovered princely grave at Corinaldo (Boschi 2018)), still little is known about regional settlement patterns and the social dynamics behind them, land use systems and subsistence. This can partly be ascribed to a traditional focus on (rich) Piceni burials, but also on the research questions of regional archaeological projects. These have often been centered on the historical phases: from the surveys of the territories of Roman towns like *Cingulum* (Percossi and Silvestrini 1986), *Cupra Marittima* (Ciarrocchi 1999) and *Asculum* (Conta 1982) in the 1970s, the *Formae Italiae* mapping project around Roman *Trea* (Moscatelli 1988) and the surveys around the Roman towns of *Urbs Salvia*, *Pausulae* and *Cluana* (Vettorazzi 1987; Moscatelli and Vettorazzi 1988) in the 1980s, in the 1990s and early 2000s the systematic surveys in the *ager Pisaurensis* (Campagnoli 1999) and the Pisa University surveys near the Roman town *Firmum* between the rivers Aso and Tenna (Pasquinucci and Menchelli 2004; Menchelli 2012; but see also Ciuccarelli 2012 for a protohistoric study of these surveys), to a predominant focus of the PVS project itself on the historical phases, as its original title was *'The Potenza Valley Survey. From Acculturation to Social Complexity in Antiquity: a regional geo-archaeological and historical approach'* (Boullart 2003).

Nevertheless, all these mapping projects have also recorded pre-Roman surface artefact scatters attesting to the *longue durée* of human presence in Marche. These records paint a picture of predominantly small-scale settlements with a low level of centralization up to the Roman colonization in the third century BC. This dispersed settlement pattern is difficult to associate with the elaborate burial clusters which suggest increasing social complexity and distinct territorial behavior from the Late Bronze Age onwards. We appear to be missing a piece of the puzzle to be able to understand the socio-economic and socio-political structures and cohesion of these communities. We argue that to grasp these issues we have to look at the whole habitus of a community; i.e. to look at the landscape continuum, and that we have to employ additional methods to uncover the whole spectrum of human activity. In the following section we present the environment in which the communities under study moved and what is known about the pre-Roman groups in our focus area, the Potenza Valley.

4. The Potenza Valley and its pre-Roman record

The PVS targeted three transects in the coastal, lower, middle, and sub-Apennine zones of the Potenza basin, which are representative of the landscape and climate zones in this part of Adriatic Italy (Figure 3). The Potenza river is ca. 80 km long and flows from its origin near Monte Pennino (ca. 1600 m) towards the Adriatic coast through an elongated basin of ca. 775 km² (Goethals *et al.* 2005). In the upper valley it cuts two limestone / marl anticline ridges, the Umbro-Marchean chain and the Marchean chain, which result in dramatic gorges near Pioraco and San Severino Marche. These two cuts offer passageways into an inland basin known as the Inland Marche Basin or the Matelica-Camerino synclinorum, an undulating landscape zone of colluvial and alluvial deposits and occasionally preserved Middle and Lower Pleistocene river terraces (Taelman *et al.* 2017: 48). The Inner Marche Basin flourished in the Iron Age, especially in the Orientalizing period (7th century BC), as can be seen in the exceptionally rich funerary record of the Piceni center situated on the remnant river terraces at Matelica (Silvestrini and Sabbatini 2008). Matelica is also one of

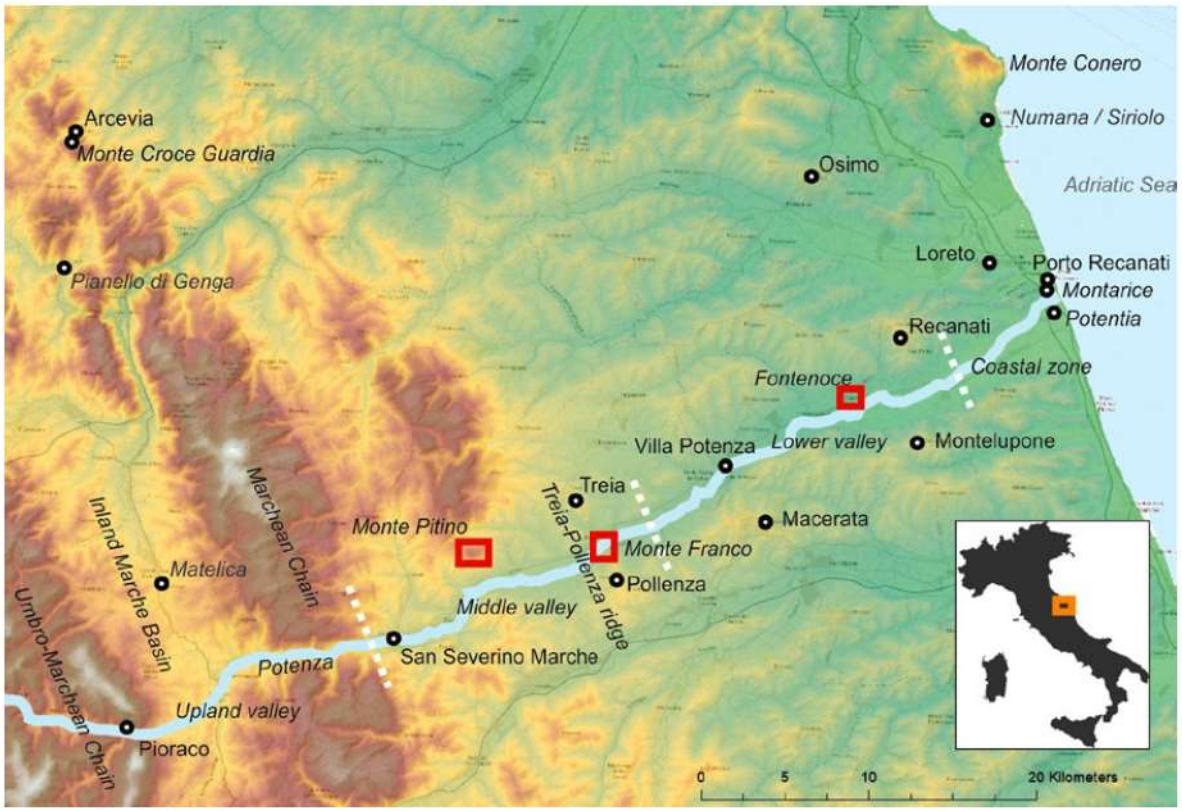

Figure 3. The Potenza valley (Marche, Italy). Areas and sites mentioned in the text are indicated.

the few excavated Piceni settlements in Marche and serves as a point of reference for our work, even if it has only been partially investigated and problems with its chronology are not solved.

The central part of the Potenza valley is characterized by a 10-100 m wide meandering river bed. The landscape is hilly with ridges, often steep slopes and incised secondary valleys. The ridges consist of Miocene-Pliocene pelitic-arenitic deposits (metamorphosed sandstones), sometimes with pronounced outcrops such as the Monte Pitino near San Severino Marche. The Monte Pitino prominently overlooks the middle Potenza Valley and the lower neighboring ridge of Monte Penna, where a well-known Orientalizing Piceni necropolis was discovered in the 1950s. Further Piceni burials were found in the valley bottom, at Ponte di Pitino, indicating that Iron Age activity covered all altitudes in this part of the valley. Locating the settlement(s) associated with the community buried at Monte Penna and understanding the spatial organization of this micro-region are among our current questions. Our working hypothesis is that an associated settlement center may have been situated on top or on the slopes of the Monte Pitino. The summit of Monte Pitino is overbuilt by a Medieval castle but following archival records of rescue excavations in the 1980s and topographic work by the PVS we presume that older (Iron Age and Roman) settlement remains are also present (Vermeulen *et al.* 2009; Vermeulen *et al.* 2017: 70-73; De Neef and Vermeulen 2018).

At Passo di Treia the Potenza cuts through a third ridge, this time a sandstone one running between Pollenza and Treia. The result is a remarkable bottleneck overlooked by the Monte Franco hill (fig. 5). Delia Lollini excavated a Bronze Age site near the top of the hill in the 1950s (unpublished; mentioned in Piangatelli 1970). At the base of the hill, near the river, the Iron Age necropolis of Moie di Pollenza (9th-5th centuries BC) is situated which testifies to the long-term pre-Roman occupation of this zone. On the other side of the river, further funerary traces were found during rescue excavations in the town center of Passo di Treia, while circular features possibly related to Piceni tombs were detected by aerial photography directly opposite the Moie di Pollenza site (Vermeulen *et al.* 2017: 73-78; site 23 in fig. 5). In 2001, the PVS surveys mapped several artefact clusters at the base of the Monte Franco which can be dated to the Iron Age and Roman periods, but the chronological development and spatial link of these occupation traces to the Moie di Pollenza necropolis was not further investigated. This is one of our current research aims; this case study is discussed below.

After the Passo di Treia bottleneck, the Potenza Valley becomes wider, resulting in a braided river system in a flat valley bottom broadening into a coastal plain filled with clastic sediments of up to 40 m thick. The thick sediments and alluvial inundation hinder the detection of ancient human occupation, but occasional surface artefact scatters are indicative of exposed paleo-riverbeds, such as is the case at the diffuse protohistoric artefact scatter and Roman rural settlement near Casa Apis (PVS sites 28 and 121; Percossi *et al.* 2006; Vermeulen *et al.* 2017: 154-155). Evidence for pre-Roman occupation of the valley floor comes from the Chalcolithic burials and settlement at Fontenoce, as well as the recently found Piceni tomb nearby (Finocchi *et al.* 2017). The valley is bordered to the north and south by ridges of pelitic mudstones on which Medieval towns such as Recanati and Potenza Picena are situated, but older settlement remains such as the fortified Iron Age village of Montelupone are also known (pers. comm. Andrea Cardarelli). In the subcoastal zone, the ridges are covered by remnant marine terraces with gravel layers of up to more than 5 m thick, for instance on the flat plateau of Montarice, just outside the coastal town of Porto Recanati. Here, periodical occupation between the Middle Bronze Age to the Middle Ages was established by PVS fieldwalking surveys, while Bronze Age contexts were excavated on its flanks in the 1950s (but never published). Aerial photography and magnetic gradiometry surveys confirm the presence of archaeological features including defensive structures, pits, ditches and probably habitation structures. Just south of Porto Recanati, the Potenza reaches the Adriatic coast. In the coastal zone, alluvial sediments cover ancient beach ridges parallel to the coastline, including the one on which the Roman city Potentia was built. Beyond the beach ridges, loamy and clayey deposits indicate the former presence of coastal lagoons. Apart from the prospections and excavations of Potentia

(Vermeulen *et al.* 2017: 99-111), the archaeology of the coastal zone remains poorly known because it is now densely inhabited.

The previous section presented some keyholes into pre-Roman occupation in the different landscape zones of the Potenza valley. These pieces of the puzzle must now be contextualized and connected by looking at the blank spots on the map around them.

5. Approach and methods

Our research draws on the proposition that space is intrinsic to human activity, and thus that the spatial layout of domestic, settlement, and regional contexts reflects socially and culturally given norms (Hillier and Hanson 1984; Kolb and Snead 1997). Therefore, spatial characteristics of human activity areas can be used to identify societal organization, socio-economic diversification, and socio-political complexity (Benech 2007; Cutting 2006; Pearson and Richards 2003). Spatial patterns are commonly used to this end by archaeologists on landscape and site scale, for instance in analysing burial clusters or regional settlement systems, while functionality of urban areas and large buildings have successfully been investigated through approaches like space syntax (Hillier 2014). In our work, we take a similar approach to an intermediate scale of micro-regions, covering both settlements and their catchments as the arenas of social organization at a daily-life, community scale.

Micro-regional analysis allows us to expand from a traditional settlement-focused approach to a more inclusive coverage of all areas of daily human activity. Settlements do not just consist of huts or houses, but of a wide range of structural parts and activity areas. Their arrangement reflects the internal coherence, interdependence, and communal effort of the people involved. Degrees of social interaction between members of protohistoric communities can be deciphered by looking at the spatial characteristics and arrangements of places in their wider habitat: habitations, public areas, communal structures, the placement of cemeteries, workshops, roads, field boundaries and enclosures, storage facilities, etc. In settlements, characteristics such as site extent, internal plan (structures and infrastructures), differentiation between built and non-built areas, and the presence of specific functional areas (workshops, storage facilities, ritual spaces) can reveal levels of planning and interlinkage. The presence of defensive features such as walls or moats indicates an underlying group identity and inherent distinction from other groups, while their erection requires initiative, planning and organization. The arrangement of the settlement catchment may likewise reveal much about the community's economic and political structure: separate production zones (workshops, kilns), but also waste disposal, graves, roads, and field systems all reflect levels of organization and cultural norms. Furthermore, by taking an interpretive and experimental approach to the estimation of workloads and energy input for the realization of such features, we expect to be able to make statements about community integration and internal organization of such groups.

We perform our spatial research primarily on non-invasive datasets obtained in selected micro-regions. The selection of these areas is based on the results of the PVS project and other research conducted in Marche, from which we have a general but still fragmentary idea of protohistoric location preference. We focus on the Potenza Valley because we know the area and argue that it is representative for most landscape zones in Marche, but we also look beyond the basin if opportunities arise: in 2018 we carried out fieldwork at Monte Croce Guardia near the town of Arcevia, in collaboration with the research team directed by prof. dr. Andrea Cardarelli of La Sapienza University of Rome. Our selection is based on an assessment of potentially preserved archaeological traces in the area, the quality of the legacy data, accessibility and owner consent, suitability for archaeological and geophysical prospection, and the possibilities to link our data with other archaeological studies, as we were able to do at Monte Croce Guardia.

Figure 4. The magnetic gradiometry system LEA-MINI during the 2018 prospection at Monte Franco (Pollenza, Marche).

We apply high-resolution artefact surveys, geophysical prospection techniques, aerial photography, (micro-) topographical and pedological work to get a better understanding of the occupation of selected case study areas. The integrated use of these techniques allows us to detect both artefactual (utensils, structures) and non-artefactual (field borders, empty areas) aspects of past human behaviour. Moreover, they allow us to look beyond the borders of the archaeological 'site' and to study how such human activity foci are situated in wider catchments. Pedestrian surveys are conducted at a high resolution (units of 30x30m, walker interval 5m) to be able to document small-scale artefact scatters. In areas of interest the coverage may be increased or additional 100% coverage samples may be collected (Figure 2, second from left). For geophysical prospection we mainly apply magnetic gradiometry and ground penetrating radar (GPR), but other techniques may be used as well. We use a modular GPR system of a Sensors and Software Spidar network consisting of 15 pulse EKKO PRO 500 MHz antennas, towed by an ATV, allowing the coverage of large open areas (Figure 2, left). Magnetic gradiometry surveys are conducted using a mobile LEA MINI system mounted with four Sensys gradiometer probes at 0.5 m distance (Figure 4). This light and flexible cart allows us to investigate large open areas but also to access more remote locations and sloping terrain, making it especially useful for the prospection of protohistoric remains. Pedological studies are focused on recording local soils and deposition processes affecting the archaeological record and its detectability by non-invasive prospection techniques. Targeted drillings using a manual Edelman screw auger are conducted to characterize features detected in the geophysical surveys and collect soil samples for laboratory analysis and datable materials (Figure 2, second from right). These studies are supported by micro-topographical mapping through drone imaging, conducted in collaboration with Dr Daniele Ferdani of ITABC-CNR (Figure 2, right). At Monte Croce Guardia, we will be able to evaluate our interpretation of geophysical data by an excavation planned in autumn 2019 and study the geophysical properties of the detected features. In the following section, we illustrate our research with the 2018 results of one case study area in the Potenza Valley: the Monte Franco bottleneck.

6. Case study: Monte Franco

The poorly understood settlement record of the Monte Franco area contrasts with past and current scientific interest in the nearby Piceni necropolis of Moie di Pollenza. Nevertheless, excavations of the necropolis revealed traces of Bronze Age and Early Iron Age habitation levels below 7th century BC Piceni burials (Lollini 1963: 322-323; Lollini 1966). Together with the unpublished results of Lollini's trial trenches of Middle / Late Bronze Age contexts on top of the Monte Franco (materials and excavation documentation archived at the Soprintendenza in Ancona), these attest to a long-duration occupation of both the hill and the open areas at its base. This was confirmed

by the PVS surveys in 2001 at the eastern foot of the hill where dense concentrations of Iron Age materials were recorded, including *impasto* storage vessels, local *bucchero* pottery, wattle-and-daub fragments, and imported wares such as Southern-Italian geometric and Greek potsherds (Boullart 2003: 175; Vermeulen *et al.* 2017: 73-78; fig. 5). The survey materials are contemporary to some of the tombs in the Moie di Pollenza necropolis. Our interest in this area focuses on understanding the spatial and temporal associations between the different archaeological sites, as well as the spatial organization of the wider area. An interesting aspect in our ongoing investigations here involves Lollini's suggestion, based on the variety of tomb types at Moie di Pollenza, that the Monte Franco area may have been a 'hub' inhabited by different population groups. This hypothesis can be tested by carefully assessing the spatial arrangements of other archaeological evidence.

In 2018, we conducted an intensive artefact re-survey of the arable fields east of Monte Franco. This resulted in a high-resolution surface artefact distribution map in which two discrete artefact concentrations were identified. The first is a predominantly Roman scatter with a large quantity of building and storage material and a remarkably low amount of fine wares, but also protohistoric materials indicating continuation in occupation. This site overlaps with PVS site 77 (Figure 5). The second concentration dates to the Iron Age and consists of a broad range of artefact classes including fine wares, cooking wares, coarse storage wares, and rooftiles and overlaps with the southern part of PVS site 12 (Figure 5). It is located near the south-eastern base of the Monte Franco hill and was tentatively dated to the 6th century BC on the basis of the local *bucchero* and imported red-paint wares. Interestingly, the *bucchero* wares do not occur in the contemporary Moie di Pollenza burial contexts (pers. comm. Benedetta Ficcadenti): there appears to be a clear functional difference between the sites.

The surroundings of the Iron Age artefact scatter were geophysically surveyed using GPR and magnetic gradiometry equipment. The 500 MHz GPR survey executed by Dr Lieven Verdonck (Ghent University) did not result in the detection of apparent anthropogenic features. The clayey soils of the Monte Franco area result in a high attenuation of the radar waves, due to which we only see some near-surface natural features, an effect also seen at other sites in the Potenza Valley. The magnetometry survey was more successful: a range of anthropogenic and natural features were recorded (Figure 6). A series of linear and singular magnetic features were detected in the area of the Iron Age surface scatter, but also outside of it. Targeted manual augerings confirmed their archaeological relevance by exposing anthropogenic layers with charcoal, pottery, and tile fragments; also in features which were initially interpreted as natural phenomena or highly magnetic modern disturbances. Moreover, magnetic susceptibility measurements of soil samples from the cores indicate the depth of the deposits producing the magnetic signal, typically between 80-100 cm.

The magnetic survey of the area is not finished and this discussion is preliminary, but we can already point to spatial arrangements visible in the surface artefact distribution and the associated magnetic features. A semi-rectangular, strongly magnetic feature (feature 1 in Figure 7) is situated within a linear feature following the base of the Monte Franco (feature 2). Coring in this anomaly revealed burnt clay and tiles, indicating its architectural character, which we now interpret as a residential building. Artefact survey of this area is severely hindered by vegetation, due to which we cannot conclude whether this feature is related to surface material contemporary to the Iron Age scatter. Buildings with roof tiles and stone foundations are commonly assumed to be introduced in Picenum in the 6th century, but there are few direct parallels. An additional problem is that absolute dating of such contexts is problematic due to the so-called Hallstatt plateau in the calibration curves of C14-dates between 800-400 BC, but in the future we hope to be able to provide a relative date for this feature based on *in situ* artefacts.

Further north in the same linear feature, there are more magnetic anomalies which were confirmed to be anthropogenic; most notably a reversed-comma shaped feature within the actual surface

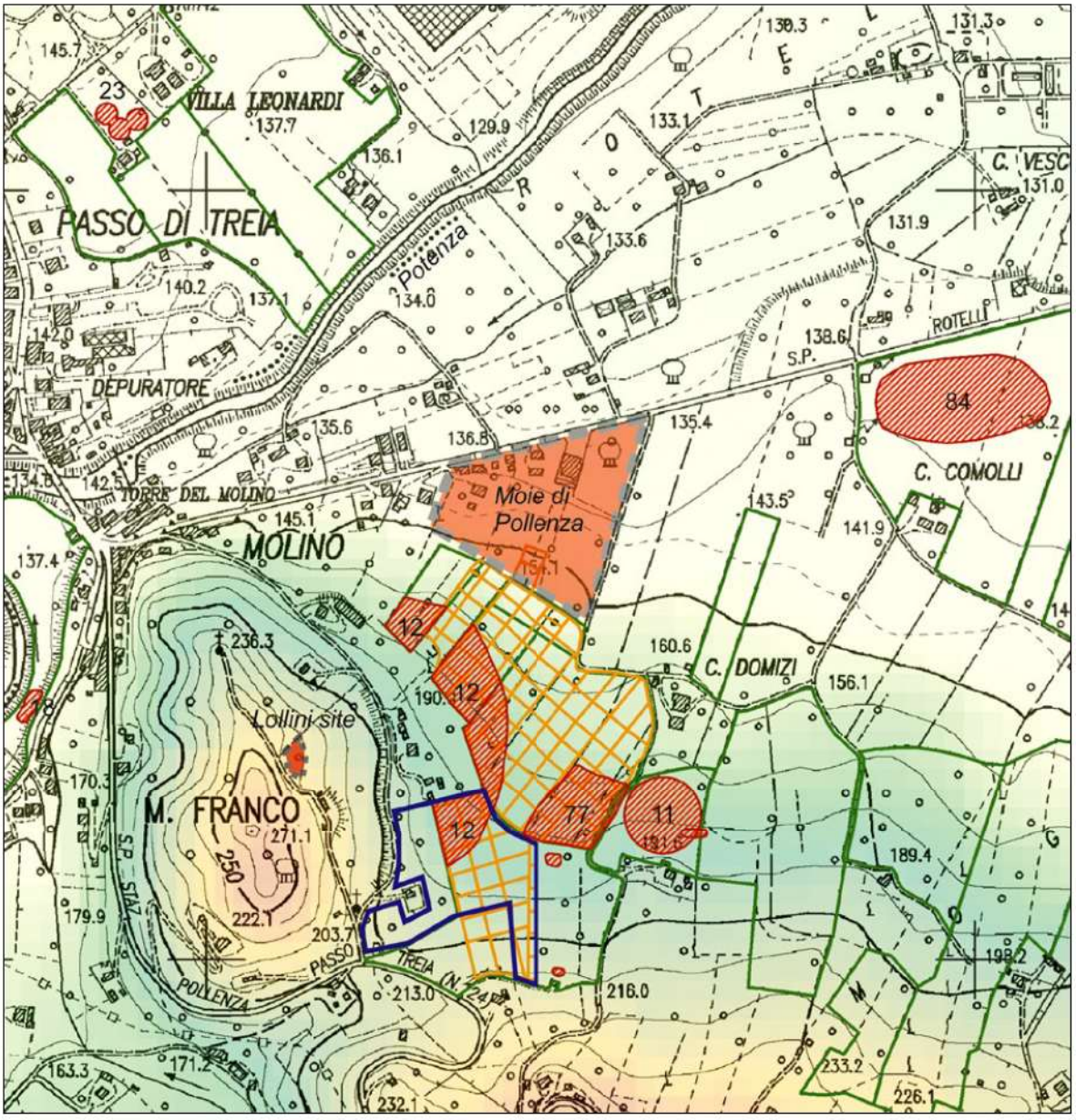

Figure 5. Overview of the Monte Franco area (Pollenza, Marche) on the 1:10.000 IGMI topographical map. The 2001 PVS extensive survey areas are outlined in green; the 2018 survey areas in yellow. Surface sites recorded during the 2001 PVS survey are indicated with labelled hatched red areas. The Moie di Pollenza necropolis and the area of Lollini's 1953 excavations near the summit of Monte Franco are indicated in red with dashed grey outline. The 2018 geophysical survey area is outlined in blue.

scatter (feature 3). Striking is the curvilinear feature in the centre of the investigated area (feature 4) which does not relate to the present-day morphology. It may be interpreted as a terrace or enclosure wall, but further research is needed; an extension of the magnetometry survey and targeted coring in 2019 will hopefully give more insight in the nature of this feature. South of this curvilinear feature are a number of positive magnetic features (cluster 5); the ones targeted by coring are all caused by man-made deposits with highly magnetic properties, including burnt clay and organic soil with charcoal and pottery.

The Monte Franco area shows clear indications of deliberate spatial planning, but we also see changes in land use through time. On the basis of excavation sketches we were able to reconstruct the location of the Middle / Late Bronze Age site excavated by Lollini in the 1950s on top of

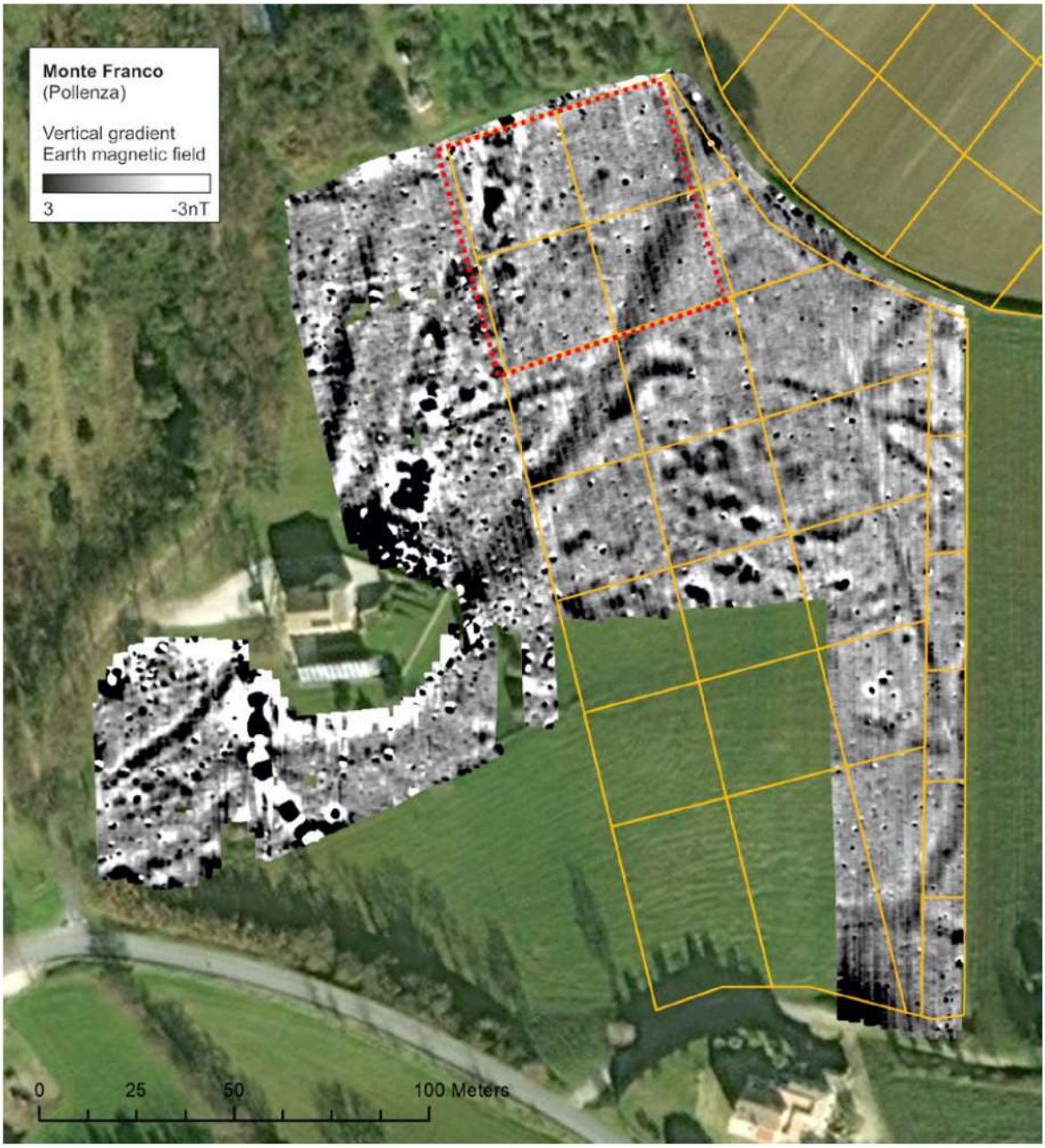

Figure 6. Magnetic gradiometry results of the Monte Franco area. The survey units with the highest protohistoric artefact densities, overlapping with PVS site 12 as shown in Figure 5, are outlined with a red dashed line.

the hill (Figure 5). The Moie di Pollenza necropolis partially overlaps with settlement remains contemporary to the hilltop site (Lollini calls these 'nivelli apenninici', i.e. Middle Bronze Age levels) and with Early Iron Age (9th-8th century BC) habitation contexts. However, in the 6th century BC this zone near the river becomes exclusively funeral. The 6th century BC settlement in the surface artefact data, associated with a series of magnetic features, is situated further upslope and away from the necropolis. There is a diffuse concentration of surface protohistoric material near the necropolis which may be related to the burials, as two impasto spindle whorls (which are often found in grave contexts) suggest: the necropolis may continue further south / upslope than is currently known.

Alternating occupied and 'empty' areas can also be seen in the magnetometry data: the archaeologically relevant features are aligned at the foot of the Monte Franco and border on a

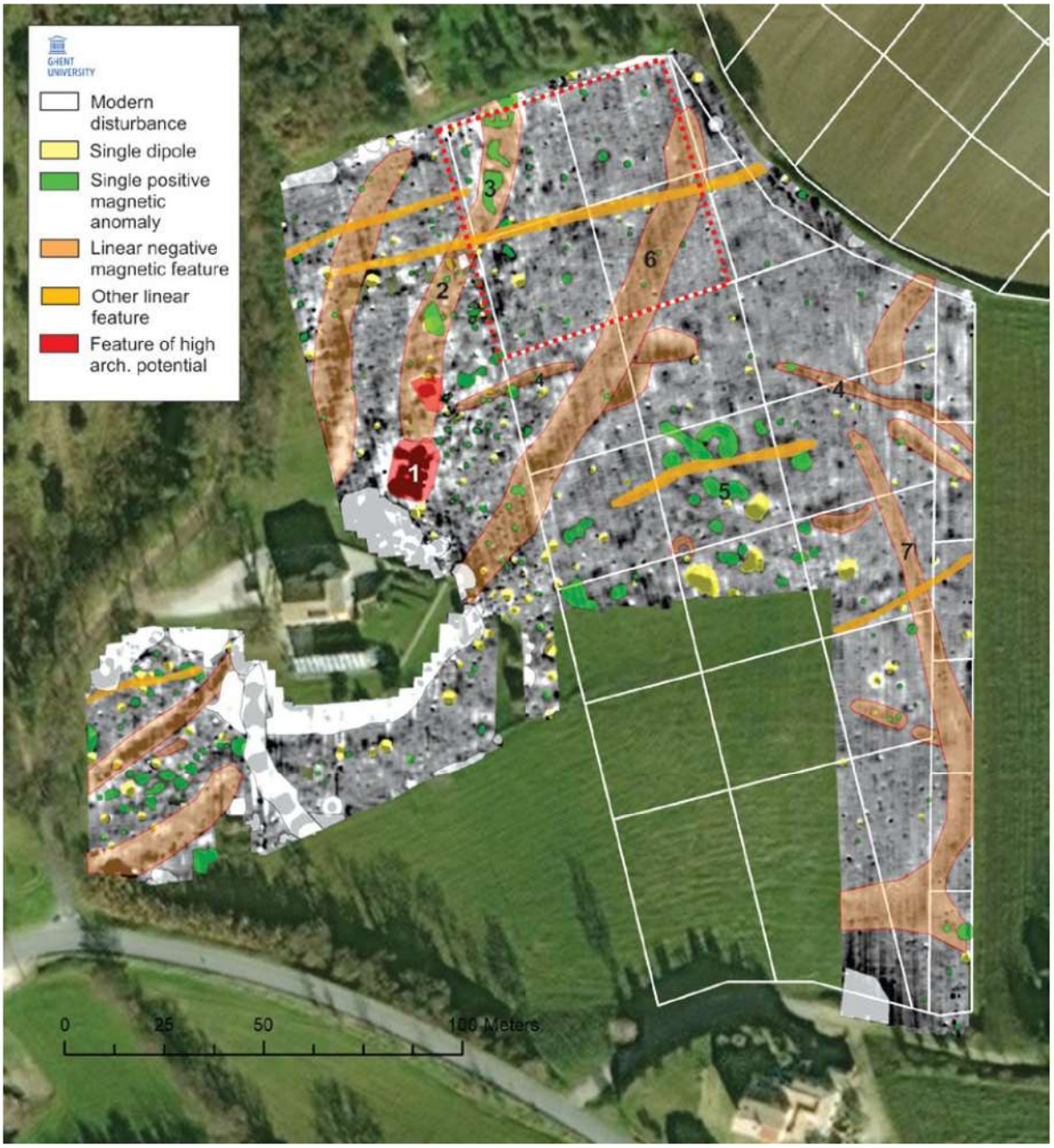

Figure 7. Interpretation of the magnetic gradiometry results of the Monte Franco area. The survey units with the highest protohistoric artefact densities, overlapping with PVS site 12 as shown in Figure 5, are outlined with a red dashed line.

magnetically quiet zone, which reflects conscious choices in how the area was occupied. The strongly magnetic features of cluster 5 are possibly related to production, located in a distinct area which is bounded by a series of linear features (features 4, 6, and 7), and are not associated with (dense) surface material. Although the partial geophysical coverage of this zone does not allow us now to make statements about the nature of the linear features, we see them as expressions of regulated activity areas.

7. Conclusion

In this brief overview we have presented the aims and approach of our current study of protohistoric communities in Central-Adriatic Italy. We focus specifically on spatial and chronological blanks in the archaeological record in this part of the peninsula: Bronze and

Iron Age settlements and their catchments. Our aim is to obtain a better understanding of the socio-political and socio-economic structures of local communities in the centuries leading up to the Roman conquest, by looking at the spatial characteristics of their daily environments. The use of non-invasive prospection techniques is central to our research questions, since they allow us to cover large areas within and beyond settlements, and trace a wide range of human activity. Accordingly, this study has archaeological and methodological implications: we hope to get new insights in a poorly known aspect of protohistoric communities by finetuning our multidisciplinary prospection methodology and using its results for interpretive spatial research. Therefor we use non-invasive prospection data not just for the identification of sites of interest, but also as an interpretive tool.

Evidently, there are a number of challenges to our approach, as we have shown in this paper. First, the detection of ephemeral traces is difficult and their interpretation often impossible without further (invasive) research. Second, the detectability of archaeological traces is complex and requires a good knowledge of local site and landscape formation processes in the assessment of various techniques. As discussed above, the Monte Franco case study is an example of well-preserved Iron Age contexts which are detectable by magnetometry but not by GPR, while the surface artefact distribution overlaps only partially with the subsurface features. Not all subsurface features produce surface artefacts, either because they are beyond the reach of the plough (horizontally or vertically), or because they are associated with artefactless activities – scenarios we have to investigate further in the coming years. In the coming campaigns, we will also test soil resistance methods on this site. Third, the spatial analysis of such areas is hindered by the low chronological resolution of successive occupation phases but also by the general nature of protohistoric traces. These are essentially non-urban environments in which we cannot identify the function of buildings, let alone single rooms, on the basis of their geophysical signature; the majority of traces in our case studies are pits, ditches, and other non-architectural elements. It is difficult to apply quantitative approaches such as space syntax on such data because of our uncertainty of the contemporaneity of single features. Therefore, we take a qualitative approach in which we try to identify different functional and productive areas, the arrangement of public and private space, and signs of regulated land management.

As for now, our research is still underway and we cannot yet present a final case. Yet the here presented preliminary data of Monte Franco, a protohistoric centre in the middle valley of the river Potenza in the Marche, shows the potential of our approach in identifying a wide range of archaeological traces and interpreting their spatial arrangement. In the near future, we hope to add more geophysical datasets to our study of this area in order to understand the organization of this particular micro-region in the valley bottom. Further work at hilltop, slope and mountaintop areas will allow us to get a better grip on the archaeological continuum of the hilly landscape of pre-Roman Picenum.

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