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Recovering the fragments of the Roman Colony of Libarna: Libarna Archaeological Project (LAP) Field Report, Season 1

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The Roman city of Libarna has the potential to add greater understanding of the social and cultural development of urban life in northwest Italy, a relatively liminal geographical area between peninsular Roman Italy and its provinces. The Libarna Archaeological Project (LAP) used several geophysical survey methods to investigate Libarna's urban plan, which is only currently known in fragments due to two hundred years of sporadic excavation and modern development. During a 3-week pilot season LAP was able to begin filling in the map of Libarna's urban area using resistivity, magnetometry, GPR, and drone photogrammetry.

Introduction

The Libarna Archaeological Project (LAP) aims to develop greater understandings of the social and cultural development of the fringe area between peninsular Roman Italy and its provinces through investigations of one of the key cities in Piemonte – the ancient city of Libarna. It is in northwest Italy, 130km south of Torino in the province of Alessandria in Piemonte. Libarna maintained a strategic position located along one of the most important ancient roads in Northern Italy, the Via Postumia. This advantageous topography is still evident today with a modern highway and major railway junction, which were laid through the site during the past 150 years. The eastern edge of the ancient city is bounded by the River Scrivia.

The Piemonte is relatively understudied compared with other parts of Italy and is often left out of traditional historical and archaeological narratives of central Mediterranean Europe during the proto-historic and Roman periods. Greater understanding of this strategically important northern Italian site, settled during the Iron Age, Roman, and early Medieval periods (6th cent. BCE - 5th cent. CE), will advance knowledge of this region and of the wider ancient Mediterranean world more generally. To investigate the socio-cultural and socio-economic history of this region LAP aims to develop better understandings of Libarna's place within current concepts of Roman urbanism in Italy, in the first instance by using non-invasive field survey to identify the layout and extent of the city. In the future the project will also carry out excavations of non-public spaces to investigate the material culture to understand economic conditions, domestic practice, and cultural interaction at Libarna, which was founded as a Roman colony in a region that was culturally Gallic.

Rescue excavations have taken place sporadically at Libarna for nearly two centuries, but there has never been a holistic, research-driven study of the site or its placement within the region of Piemonte. Furthermore, the investigations that have taken place have focused almost exclusively on architecture and public

buildings, and selected finds[1], largely ignoring the domestic and industrial architecture and a more comprehensive, contextualized study of the material culture. Only a theater, amphitheater, and two *insula* blocks are visible and are maintained by the *Soprintendenza Archeologia Belle Arti e Paesaggio per le province di Alessandria, Asti e Cuneo* (formerly the *Soprintendenza Archeologica del Piemonte*). Part of the forum, the northern and southern gates, a main roadway, another *insula* block, and some stray structures have been excavated over the past 200 years, though the precise location of most of these structures today is uncertain. The baths are currently being excavated by the Soprintendenza before the construction of a pedestrian underpass that is certain to disturb the remains.

Libarna

Prior to Roman conquest, an indigenous Iron Age settlement was established in the area sometime during the 6th-5th cent. BCE, along a prosperous trade route from the Etruscan site of Genova (modern Genoa) along the vale of Scrivia to the Po Valley. This Ligurian settlement was still occupied during the late Iron Age (3rd-2nd cent. BCE)[2], though it disappeared shortly afterwards as did many cities in region. It would seem that Rome's wars of conquest had a drastic effect on the region and the population[3]. Libarna's desirable location led to the foundation of a Roman colony in the mid-2nd century BCE, probably in connection with the opening of the Via Postumia, an important road from Genoa through Dertona to Aquileia[4].

The goal of LAP's pilot season was to gain more complete and dynamic knowledge of the city plan, to identify buildings and street layouts, and to validate or correct some of the current assumptions about elements this plan[5] (see fig. 8). An additional focus of this season was on locating possible domestic structures that could be targeted for future excavation.

This report will outline the resistivity, magnetometry and limited GPR survey carried out during the 2016 pilot season of the LAP and its preliminary findings[6].

Methodology

During the pilot season, LAP made use of three survey techniques: resistivity, magnetometry, and Digital Elevation Mapping (DEM) using a drone. Initially the project directors had planned to use GPR alongside resistivity rather than magnetometry due to abundant metal pollution from fencing, pylons, and railway lines, but, in the end, were only able to rent a machine briefly from Techgea (Turin) to compare GPR data with the resistivity data in specifically selected places.

Selected sections of seven different fields (Fields A, B, H1 & 2, L, Q, V, W and Y in fig. 1) were surveyed by magnetometery and resistivity[7].

Fields A, B, H1, H2 and V are located on the property of the Soprintendenza[8]. The other fields are privately owned and had been recently harvested. An important task of this field season was to establish a dialogue with local land owners for permission to use remote sensing techniques on their fields. We were successful in that we had not anticipated being able to survey private lands in this first season but were given permission to use the geophysics machines on any land not in crop. The drone was further freed from this requirement as it is completely non-invasive and was able to take images of any area in which permission was gained.

Areas that could be surveyed using the available equipment were limited by the modern industrial environment that has developed around and over the ancient site. In particular, Libarna is bisected by a major road and two railway lines, which cover the area where evidence of what is thought to be Libarna's forum has been identified[9]. There are also numerous electrical pylons, as well as metal fencing used to protect the already ex-

[1] e.g. FINOCCHI 1996.
[2] VENTURINO GAMBARI 2014: 13.
[3] BEROCELLI 1922: 362-363.
[4] VENTURINO GAMBARI 2014: 11.
[5] see. e.g. ZANDA 2004.
[6] A separate article on the use of the drone at Libarna will follow (Boyle n.d.).
[7] Barington Grad 601-2, Geoscan Resistance Meter RM85.
[8] Fields are defined by current barriers such as fences, hedges, ditches, roads and railway lines.
[9] FINOCCHI 1996: 75-76.

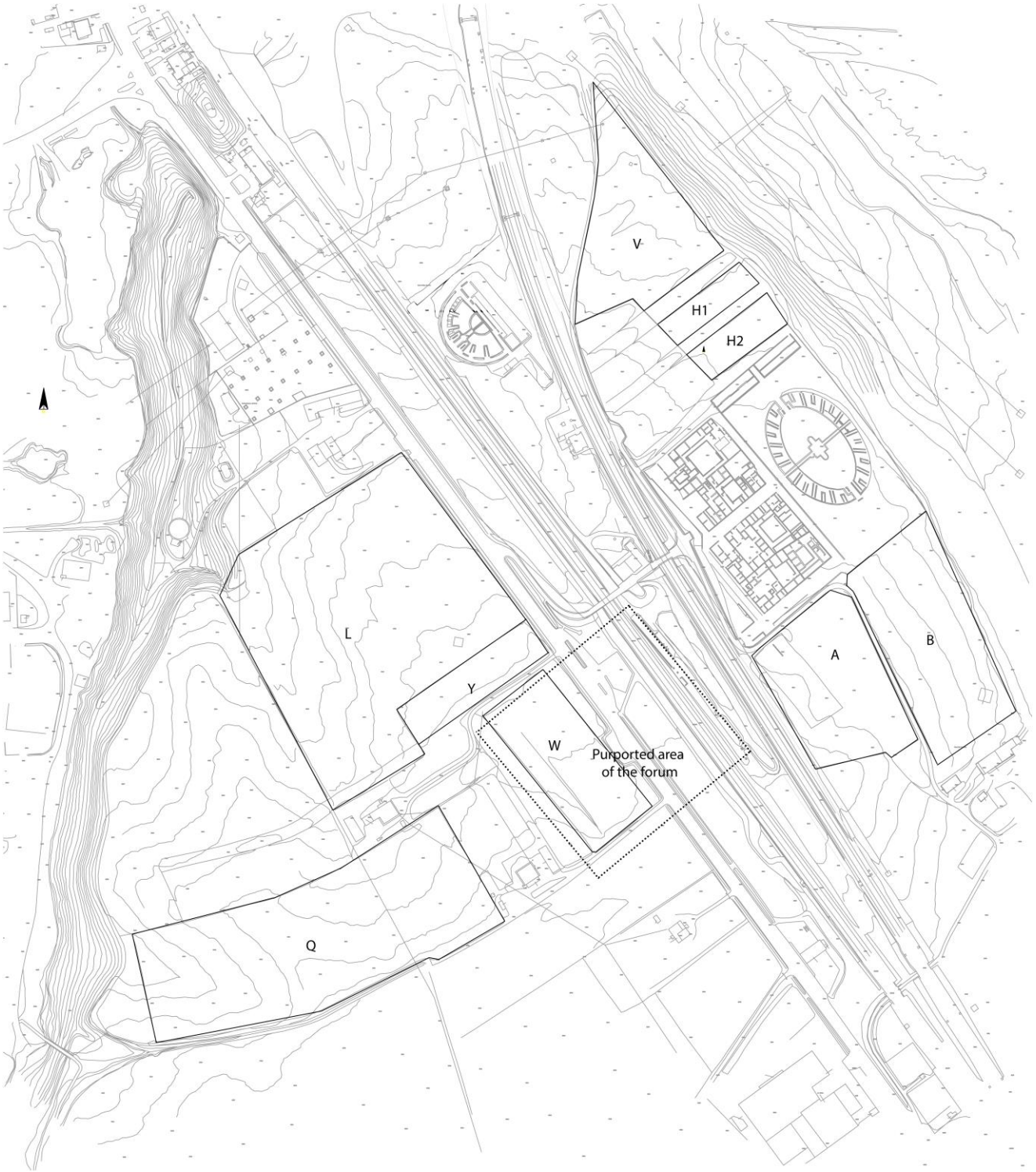


Fig. 1. Map showing the visible remains of Libarna among the modern structures, road, railways, pylons, and power lines, and the fields. Areas with borders in bold indicate areas surveyed during the 2016 season and include a letter designation. (image courtesy of the Soprintendenza Archeologia Belle Arti e Paesaggio per le province di Alessandria, Asti e Cuneo).

cavated areas of the site, subterranean and aerial power lines, and other types of metal pollution on the site of the ancient city that made survey with the various machines complicated. Thus, each individual field had its own special requirements for the selection of areas that could be surveyed, based on proximity to these inter-

ferences. Surveyed areas were set up in grids of 20m x 20m and walked clockwise beginning in the northeast corners.

The drone took images of all areas believed to have been part of the ancient city with photogrammetry for digital elevation modeling (DEM). With these DEMs the topography of the site could be created with exceptional accuracy and speed. The drone was only prevented from flying over areas with obstacles such as multiple power lines although it was not flown over areas where crops or vegetation prohibited any likely results. We were fortunate that it was a dry year as this meant the crops were harvested early and the land was freshly mowed allowing the best images possible for DEM production. The drone covered all the regions of the city maintained and controlled by the Soprintendenza, such as the theater, amphitheater and insula blocks. We also had coverage of most of private fields in the proposed area for the ancient city. However multiple years with differing crop patterns and sun angles will be required before a truly accurate rendering is possible. This year was a good start to our future endeavors.

Survey results by field

Field A

Field A lies to the south-western area of the lands belonging to the Soprintendenza and measures 114m x 75m. It lies to the south-east of the purported center of Roman Libarna. Its layout is approximately in line with the excavated insula blocks to its north, where the visible remains of the houses and amphitheater lie. To the west of the field are two railway lines. The field itself is crisscrossed with aerial power lines and surrounded by metal fencing. Readings with the resistivity machine also suggest that several terrestrial power lines run lengthwise through the field.

Field A contains indications of a large trench, 65m x 30m lengthwise along the western edge. This is probably the location of excavations by E. Zanda carried out in 1989-1991[10]. Inside the trench a wall is visible along the surface, roughly in line with the city insula blocks. In the center of the field were cut stone blocks, the purpose of which could not be determined.

The first grid surveyed by LAP was in Field A. A single area measuring 40m x 60m, divided into 20m x 20m grids, was set up in the northernmost part of Field A. The field was surveyed with the magnetometer, resistivity machine, and DGPS.

This field posed numerous problems for the magnetometer, resistivity machine, and drone. Trains passed by approximately every 13 minutes on the track closest to Field A, causing large electrical spikes to occur as registered by the resistivity machine. Despite attempts to mitigate the influence of the surrounding environment, such as pausing recording each time a train passed, the data gathered by both the magnetometer and the resistivity machine was more or less useless. The metal contamination and electrical surges skewed the data requiring heavy processing which removed details and obscured any features. The drone was similarly affected. While trying to photograph the field, the drone suddenly shut down and fell from a height of 30m, damaging the propellers and battery pack.

Field B

Field B lies directly to the east of Field A and measures 63m x 143m. It too is surrounded on all four sides by metal fencing. Due to the presence of a pylon in the southern area of the field, the area surveyed was irregular.

To begin with, a 40m x 80m block of eight grids was set up in the northern area. An additional 20m x 20m grid was added to the southwestern end of the block. Two additional 20m x 20m grids were added to the eastern side of Field B to collect information about a depression running parallel with the edge of the plateau. These grids (10 and 11) were placed next to grids 7 and 8. Sg. Gian Luigi Traverso, who has lived and farmed to the south of this field for many decades, informed us that the depression was from a former pylon[11]. No evi-

[10] LAP has as yet not been able to access a report of these excavations.
[11] Traverso pers. comm. 20/7/2016.

Fig. 2. Resistivity image of all grids surveyed in Field B.

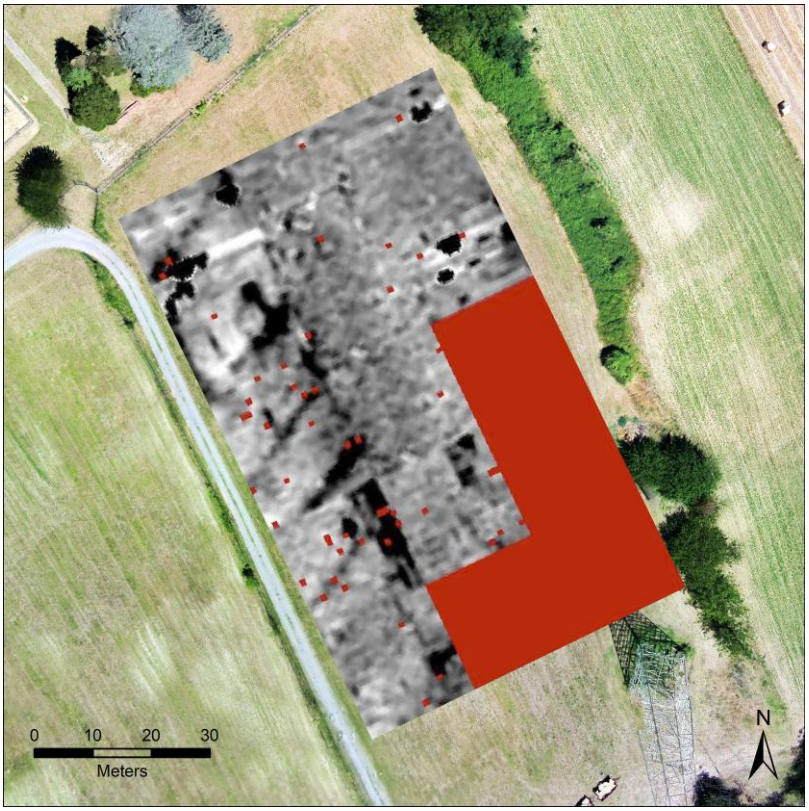
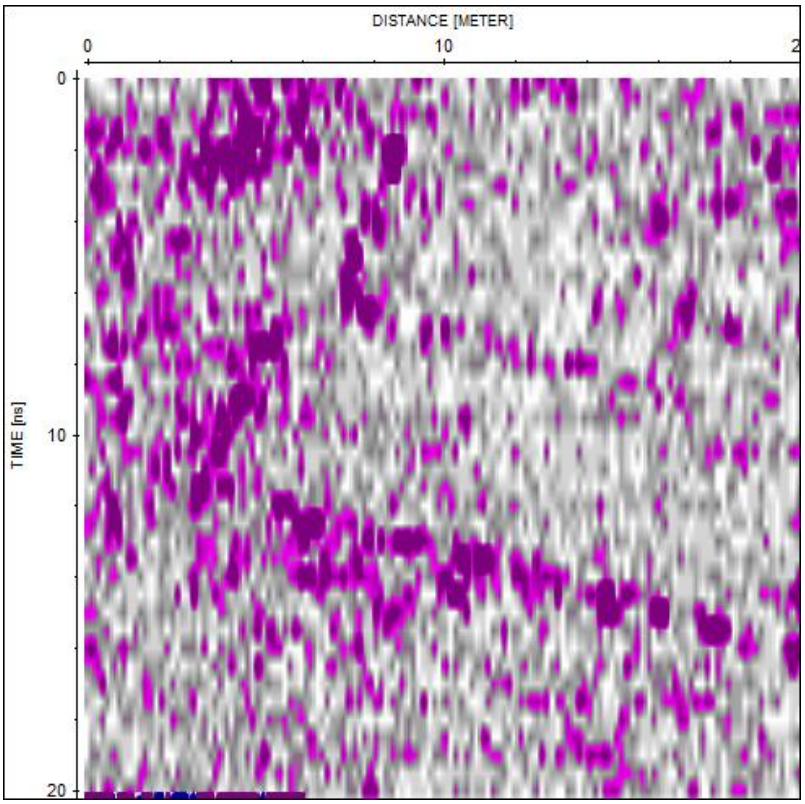


Fig. 3. GPR image of Field B grid 2.



dence from the resistivity contradicted this interpretation. Sg. Traverso believed that he remembered the spoil from earlier excavations of the insulae to the north being dumped along the eastern side of this field.

Again, the magnetometer was not useful in the field due to the metal contamination from fences and other sources (a number of shotgun shells were recovered during survey). The resistivity machine, although it suffered from some wiring difficulties, indicated multiple walls in grid 2 (fig. 2).

The curious feature of these walls is that they are not in the same line as the excavated city insula blocks. Instead they appear at an angle not in line with the city plan and projected grid. These data were later confirmed by GPR (fig. 3). However, structures were seen at a depth of 0.7-0.8m, which is the same depth as these already excavated insulae. A series of walls with interior divisions, again not in line with the city blocks, were visible in the same location. The readings from the GPR also picked up on the structures, c. 0.7m below the surface. Due to time and resource limits, only two 20m x 20m grid was surveyed using the GPR.

Field H1 and H2

The decision was made to survey the two fields to the north of the amphitheater and to the east of the city bath complex. The fields were given number designations due to the line of thick shrubbery that almost entirely separates the fields into two rectangles (H1: 65m x 18 m and H2: 60m x 20 m).

An area of 10m x 30m running east to west was demarcated in each field; divided into three 10m x 10m grids. The grids were aligned along either side of the shrubbery in order to capture some of the irregular topographical elements. While Field H1 had no structures visible, H2 closer to the amphitheater revealed walls a meter-thick, potentially a continuation of the public structures found to the south (fig. 4).

Fig. 4. Resistivity images of Grids 1-8 in Field L

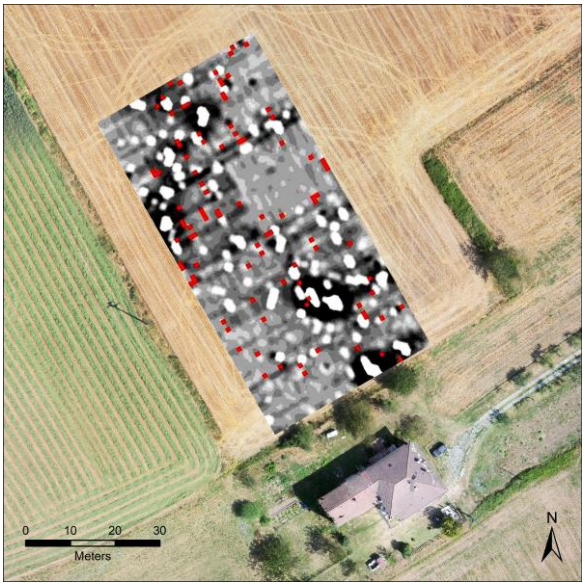


Fig. 5. Stone-lined channel in ravine to west of Field Q, looking north. Photo P. Allison.

Field L

Field L is a large, privately owned field lying to the west of the area of Soprintendenza's land. It measures 120m x 179m with an additions area of 40m x 70m area jutting out to the southeast. As field L is located near the forum and we hypothesized that it would be rich in architectural remains. However, we are interpreting this field cautiously as the resistivity machine was experiencing mechanical failures but there are suggestions that Field L contained a notable architectural find. The structure measures approximately 40 x 20m. The size of it suggests its function might be a public monumental structure. This would be very likely as it is located only 150 meters from the forum. The tripartite structure that is hinted at in the resistivity image might indicate this is a temple and if it is it would be the first religious structure found at the site (fig. 5). Certainly, more investigation is required before firm conclusions can be drawn.

Fig. 6. Stone-lined channel in ravine to west of FieldQ, looking north. Photo P. Allison.

Field Q

This privately-owned field, measuring 85m x 224m in length and located away from power pylons and train lines, had immense potential. Thus 18 grids were created and surveyed with the magnetometer and 14 were surveyed with the resistivity machine. However, no structures were visible in the geophysics in the western end of the field. This field had a sharp escarpment on the westernmost side of the field. In the ravine to the west of this field is evidence of a stone-lined channel, possibly a drainage ditch (fig. 6), which could potentially be a drain from the Roman period, but further investigation would be necessary to confirm.

The eastern half of Field Q, closer to the road had visible crop marks seen by drone

imagery and visible in satellite imagery (fig. 7). This large square structure [approx. 45m x 44m] has long outer walls and some indications of interior divisions but this would require further investigation to confirm. This structure is in line with the city layout and is adjacent to the area identified as the forum, underneath Field W and the highway and railway lines[12].

Fig. 7. Satellite image of large building in Field Q. Map image: Google Earth.

Field V

Field V, maintained by the Soprintendenza, is triangular, measuring 117m x 106m, with a hypotenuse of 141m. Eleven 20m x 20m grids were set up using the tree line to the east as the baseline. In grids 1 and 2 there is indication of around structure (fig. 8).

A map and site plan in the early 20th century visitors' guide (Poggi 1909: figs 1-2) place a round "*monumentum*" approximately in the centre of area H (fig. 9). The monument is no longer visible from the surface and there are no traces of it in the field. Given the age of the map by Poggi and the difficulty in aligning earlier excavation plans with a modern map the structure evident in Field V might provide evidence for the round '*monumentum*' in Poggi's plan. More study is necessary before such a claim can be made for sure, however

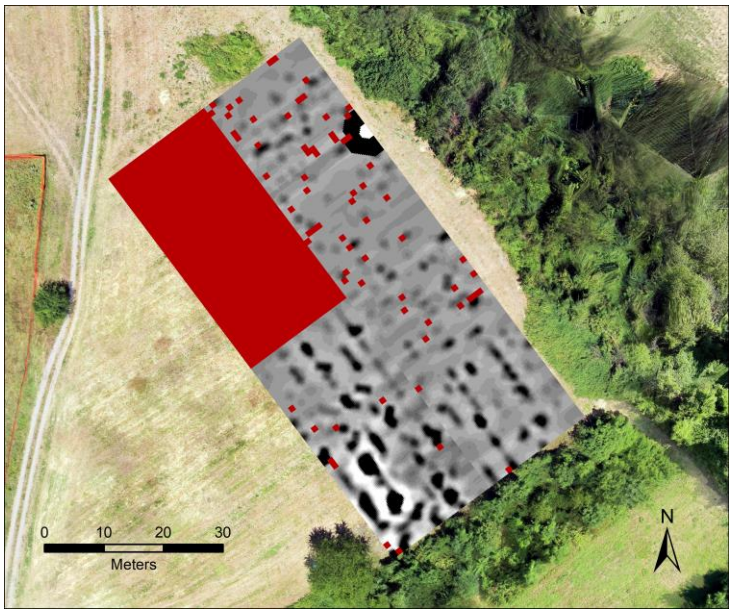


Fig. 8. Field V grids 1-6, note the half of a round structure at the top of the image.

[12] The forum was excavated during the 19th century and only its approximate location is certain. The exact location of the forum was confirmed during our fieldseason the following summer.

this would go a long way towards realigning previous excavations into our modern maps. Thus, the resistivity data may indicate where that monument had been removed from. Elsewhere in field V there is much apparent disturbance to the deposits in this field, which could be evidence of robbing pits or of the removal of stones, perhaps to improve the agricultural productivity of the field. This is especially evident in the northeastern half of the field. Grids 4-5 indicate there may be a structure in the southwestern part of this field (8m x 14m). However if this is the case its walls are very damaged.

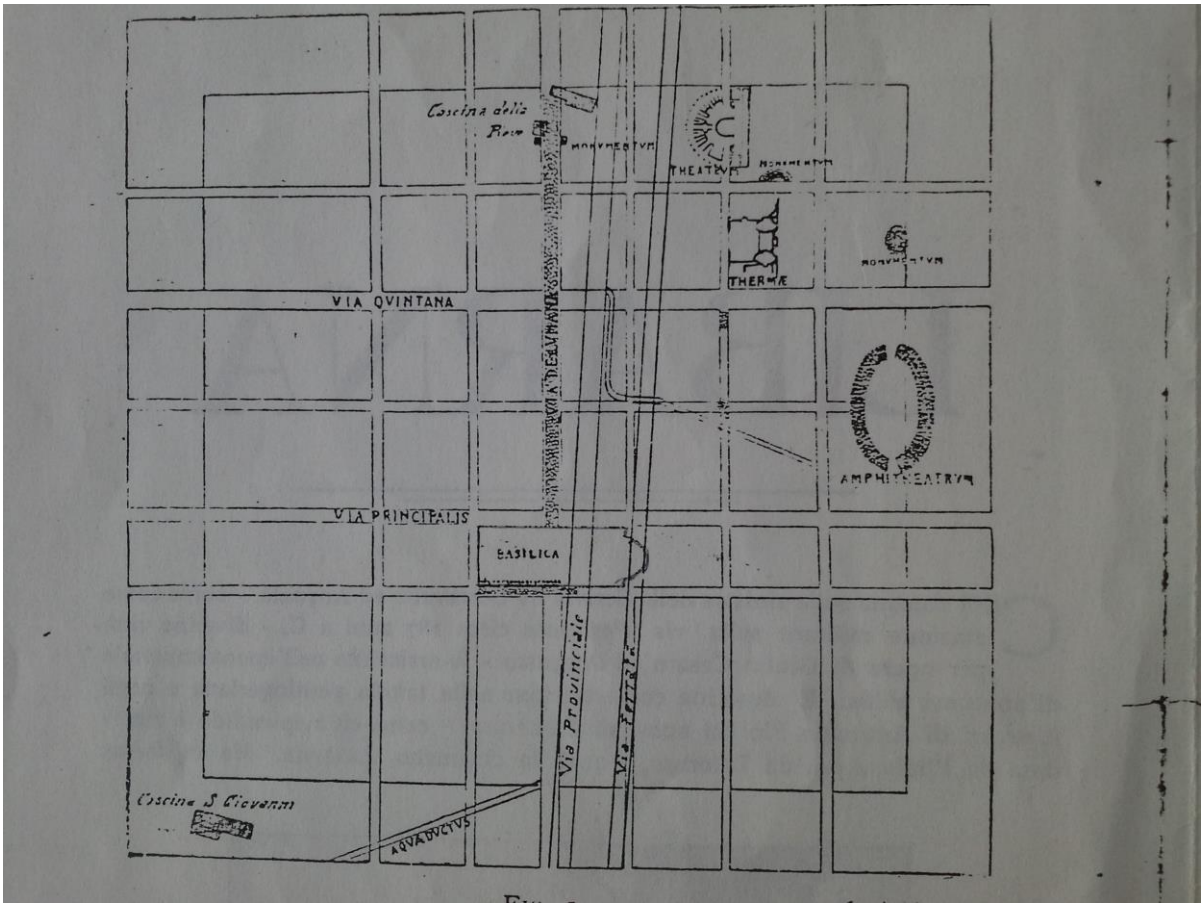


Fig. 9. Pre-1909, largely hypothetical plan of Libarna, showing a 'monumentum' north of the amphitheatre (in Field H), and 'basilica' in area of Field W (Poggi 1909 fig. 1).

Field W

This private field corresponds to the western part of the area identified as the forum[13] (fig. 1) and where the remains of a basilica had been excavated at the beginning of the 20th century[14] (see also here fig. 9). The field measures 118m x 50m and an area of 80m x 40m was gridded into 20m x 20m blocks for survey. This field was located near the busy modern road. We found that the machine was adversely affected by the traffic. In an attempt to compensate for the disturbance, we tried to collect data during the weekend when there were fewer cars. This allowed us some further clarity with the images; the analysis, however, was still rough. From what we can tell the resistivity images revealed potential walls, approximately 8m apart, running west to east (fig. 10). A structure measuring 20m x 17m in the southern section of the field is also visible through satellite imagery of crop marks (fig. 10).

[13] see FINOCCHI 1996: 75-76; ZANDA 2004.
[14] POGGI 1909: frontispiece.

Field Y

The season ended with the survey of Field Y, which measures 120m x27m. An area of 40m x 40m was divided into four grids of 20m x 20m for survey. No significant finds were discovered in this field. Given its location next to potential forum this is very surprising however we do not know the history of this field and how it might have been treated differently than its neighbours. Further investigation is required before firm conclusions can be drawn.

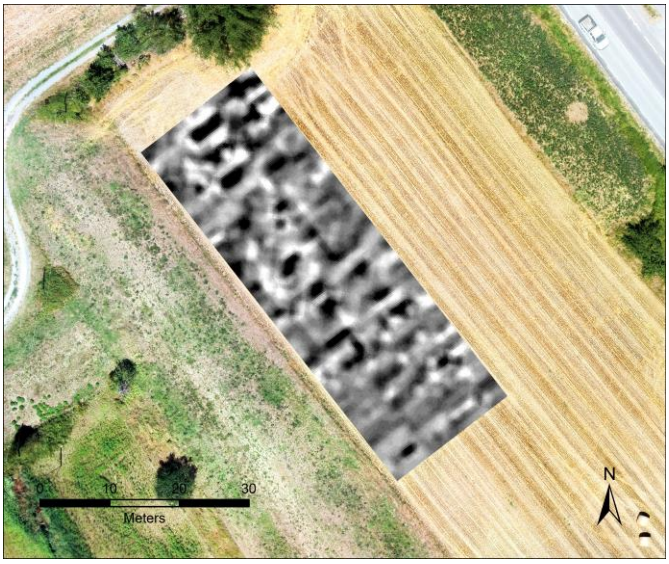


Fig. 10. Satellite imagery of structure visible in crop marks in Field W. Map image: Google Earth.

Conclusions

Libarna is a site with great potential to expand our knowledge of Roman northern Italy and to understand its similarities as well as its differences with Roman sites in the peninsula. To date, only some of the large public structures and two urban blocks have been investigated, and then only partially, leaving many parts of the site unexplored. Our current knowledge of Libarna has been constructed through piecemeal excavations over two centuries, many of which were not properly documented or published. As a result, the picture presented of this ancient site is one of a typical Roman colony.

A more holistic view of the site is being achieved through geophysical survey and new insights into the ancient structures have been offered. During this preliminary survey by LAP, using multiple geophysical techniques, many structural traces have been found, including of large structures of Fields L and Q and smaller structures in Field B. The latter do not appear to be aligned with the rest of the Roman urban grid plan. Despite the limitations of modern constructions and the fact that much of the city is currently in private hands, in this first season we have been able add to the current information about the layout of the city of Libarna. These discoveries prove the potential for further survey and targeted excavation to reveal more about the city's extent and character, its material culture and place in the region.

Acknowledgements

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