

THE ROMAN CITY OF *UXAMA ARGEALA* (SORIA, SPAIN) AND ITS STUDY BY MEANS OF REMOTE SENSING AND DIGITAL CARTOGRAPHY

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ABSTRACT:

During the last ten years, we have undertaken a research in order to elaborate a working methodology to study archaeological sites without excavating, by means of using non-destructive interventions as topographical remote sensing and land prospecting. Such methodology, called “Systematic Approach to Territory”, has suffered some changes, specially due to singular experimentation that intended to value if prior procedures were correct and efficient. Experimentation, applied to complex areas such as a Roman city (with the obvious problems of superimposed phases that make understanding more difficult), and to more simple fields as the villas, has indeed been satisfactory, and results have been published in Lectures with similar contents to the ones proposed for this 2007 Lecture. In fact, the objective for this methodology has been achieved: the structures plan without excavating, its accurate measures, and its correct location in the urban web. In some cases, due to the superficial depth of remains, it has been possible to verify that the walls indeed were located where they had been detected by aerial photography. In other cases, it has been land prospecting that has confirmed the locations of what had been detected by aerial photography. However, the project’s objective is the integral recovery of archaeological remains, previously identified by aerial photography, of the Roman city of *Uxama Argeala*. The project plans the restoration of every element detected by aerial photography and its integration in the city general plan where the structures exhumed by excavations are already drawn.

1. PREFACE: THE WORKING SCALE

One of the factors to be taken into consideration when carrying out an archaeological research based on the remote sensing is the working scale, because it influences both the field and the subject of the research (De Guio, 1992: 349-350). In the remote sensing the working scale varies depending of the imagery materials we use; if they have a large scale *inter site*, such as the satellite images and the aerial photos displaying wide areas, the working object will be the territory and the sites it contains. On the other hand, the use of imagery materials with a small scale (*off site* and *in site*), such as the vertical or oblique aerial photos at a low height, is useful to study the site inner layout. These last materials are those affecting our project, the aim of which is to study the urban topography of a semi-excavated Roman town by means of the remote sensing.

2. CONSIDERATIONS ABOUT THE *OFF SITE* AND THE *IN SITE* SCALE

Both of these working scales use similar imagery materials, since the goal is to identify and to study the traces related to buildings. Nonetheless, the scopes they refer to are different: the *in site* scale concerns the study of the site inner topography, i.e., the Roman city of *Uxama Argeala* interior, while the *off site* scale concerns the surroundings close to the city (Figure 1).

After these considerations, we can summarize the study aims referred to the *off site* scale of the Roman city of *Uxama Argeala* (García Merino, 1987: 80):

- outskirts quarters outside the walls;
- military camps;
- necropolis;
- access to the city by the communication routes;
- the walls, dividing element between the off site and the in site areas;
- other infrastructures out of the city, but linked to it (drainage, aqueducts, etc.).

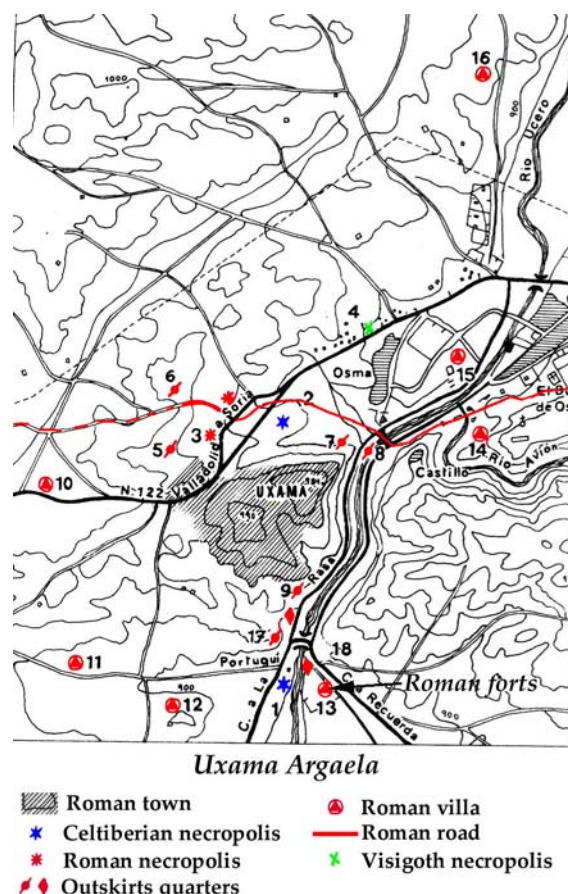


Figure 1: map of García Merino showing the location of the remains situated out of the walls (García Merino, 1987)

The purpose of the in site scale, the site inside study, both the urban layout and the buildings, is slightly different. The first aim regarding the methodology is to identify the streets of the

city layout by integrating the information from the archaeological excavations with that from the remote sensing. The second aim is to identify and delimit the buildings. In this case, it is important to try to differentiate between a public and a private building, since it is well-known that the first ones are usually built with better masonry and bigger size than the private ones, what results in a better visibility of the aerial photos traces. The knowledge about the architectural typology of the public buildings is useful to interpret the use of the identified public buildings, as far as possible.

All the detected evidences will be rendered and integrated in a general digital plan, because the digital or numerical cartography is the ideal support to document and analyse these evidences.

3. AN OFF SITE SCALE EXAMPLE: THE UXAMA FORT

The evidence of the archaeological remains of the Uxama fort was discovered in 1991 by air reconnaissance made by the aerial archaeologist J. Del Olmo. In 1996 C. García Merino published the results, offering the first functional interpretation of the evidence (García Merino, 1996). At that time we were looking for another aerial photography to finish off the photographic documentation about the Roman settlement. The results were very interesting, because with the new materials of imagery (an ortophotography in particular) it was possible to determine the exact scale, position and orientation of the fort evidence (Figure 2).

The Roman fort is located seven km south from the town, near the entry of the Ucero river canyon. Its position is very strategic, because might be controlled the principal access roads from the South: the *Uxama – Termes* and *Uxama – Ocilis* roads. The fort shape is rectangular, with its angles rounded, a characteristic of the Roman forts in the Early Empire. The evidence visibly draws on the ground two parallel black lines, which are separated 10 metres from each other. Thanks to the use of a scaled ortophotography it has been possible to know the fort measurements (185 by 125 meters). The fort orientation is almost North – South, with a light deviation to the northwest.



Figure 2: the evidence of the Roman fort remains

Further evidence, unknown up to now, has been detected 60 meters to the South. The shape of these remains is like the previous described, because it shows two parallel lines darker than the colour of the ground. Its orientation is absolutely North to South and its measurements are 225 by 150 meters (these

latter measurements are hypothetical, because the confined extension of the ground evidence doesn't allow us to be more precise: it's less visible than the precedent fort evidence).

C. García Merino reckons the approximate dimensions of the first fort to be 2.3 Ha, which might be related to a legionary task force or to an auxiliary force of the Roman army (Figura 3). The materials achieved in the surface and near the same site of the *Uxama Argaela* town may prove it: for example a Gallic republican coin, a metal helmet of the late republic period and some epigraphies belonging to the military world. But the most interesting discovery in the Roman town is coins broken in its halves. This type of coin is typical in areas where there are Roman forts because the soldiers received their salary with coins in big fraction; to buy it was necessary to have small fractions of coins, but it was more difficult in a peripheral territory of the Roman Empire. This is the reason why there are coins fractions in some Roman towns: the existence of a Roman fort nearby.

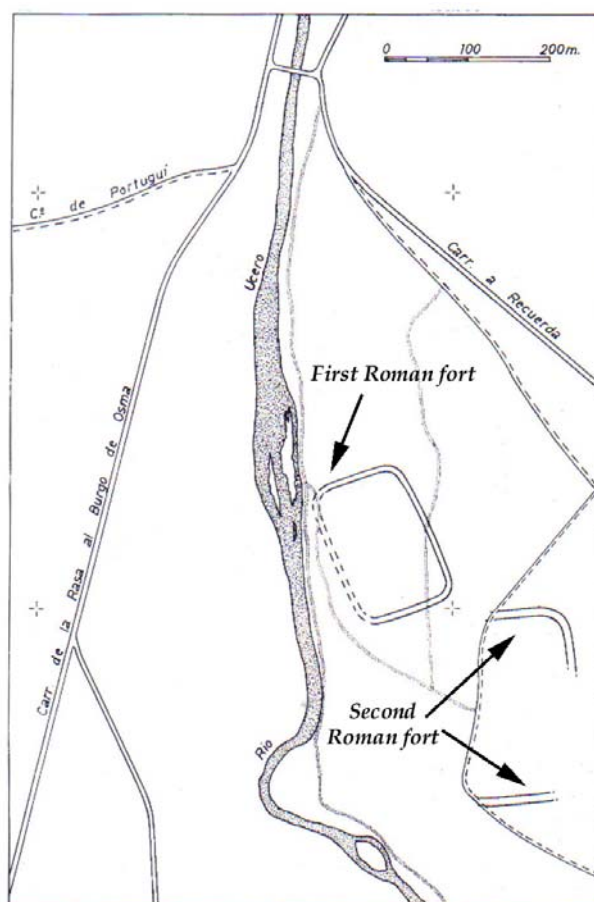


Figure 3: interpretation and plan of the Roman forts (García Merino, 1996)

The fort shape (its angles rounded) and the materials found in the ground seem to indicate a possible chronology of Early Empire, probably between the first and the second century A. D. Its function was probably to keep and to develop the countries which depended on the Imperial politics. For this reason it's possible that the Roman fort of Uxama was a quartering place of a "vexillatio", where the public works, such as roads or the city wall building, were made.

4. WORK HYPOTESIS: THE MAIN AREAS OF THE SITE

The aim we propose is maybe too ambitious, but regarding the available documentation about *Uxama Argaela*, it would be regrettable not to try to get the best out of it, i.e., a complete map of the city remains at a significant scale (1 : 500 or 1 : 1000). The result of having this documentation at our disposal is clear: a powerful documentation tool to value the site conservation state and to carry out its topographic study.

After observing the obtained materials and the morphological characteristics of the site, located on the Alto del Castro (an

irregular rough uneven height), we think it is advisable to work by sectors, according to the characteristics and complexity of the area (Figure 4).

We have already mentioned the areas out of the walls that may be interesting for the city, now it is time to focus on the interior and to design an intervention strategy, because this case is more complex.

It has been decided to divide the city into sectors, in order to delimit the areas for intervention and to make the work easier.

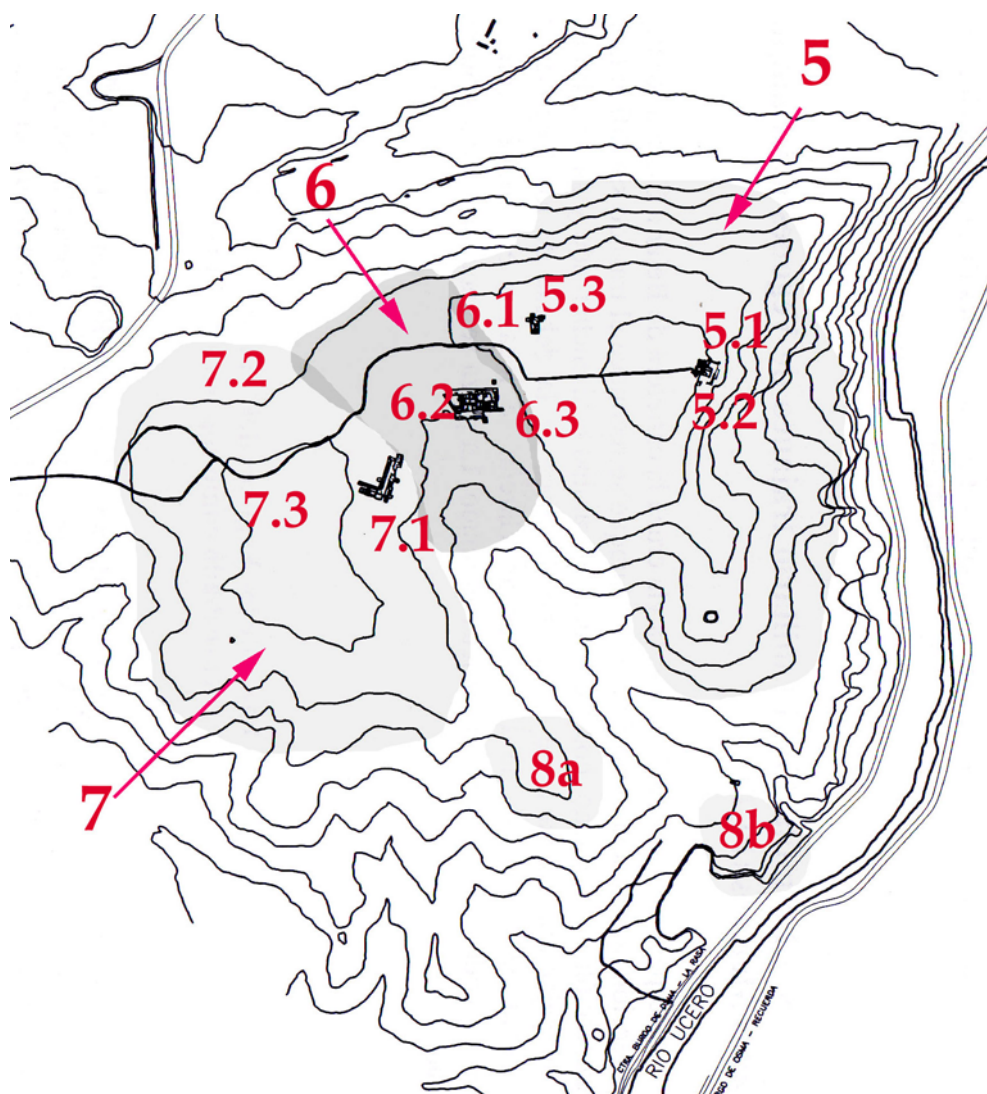


Figure 4: general map of the hill with the excavated areas and the division in sectors.

5. THE “WATCHTOWER HEIGHT”

This is the name of the main city height, which was probably occupied by the Iron-Age settlement; and was named after a muslim watchtower located at the edge of the cliff. It is maybe the most difficult to research, due to the continuous superposition of buildings throughout the centuries (since the II Iron-Age until Late Roman Times). Some interesting elements, which are immediately summarized, may help us to guide the work, since these areas are already excavated.

5.1. THE WALLS

They were excavated at the beginning of the 90's and offer important data about the constructive technique and their location. Their position, almost at the edge of the cliff; made them impregnable, but at the same time they were easily damaged once abandoned. It is possible to follow the line of the walls starting from the part already excavated, since they

emerge often (García Merino and Sánchez Simón, 1998: 121-122).

5.2. THE “WATCHTOWER HOUSE”

A *domus* was discovered very close to the wall, almost leant against it. Unluckily, because of that, it does not offer important information about the city layout, but we shall try to connect it with the evidences observed in the aerial photographs.

5.3. THE “SECTILE HOUSE”

Another *domus* has been brought to light in the middle of the watchtower plain, far away from the cliff. It is called “*sectile* house”, because of the type of mosaic that decorated some of its rooms. Although it is only partially excavated, it has proved to be more interesting, since it is part of the city layout and its walls orientation may offer significant data for the traces observed in the aerial photographs (García Merino, 1987: 80).

All over the hill there are evidences of a great number of buildings, which we need to choose, because some later walls and lot limits are superposed on the buildings and streets remains, changing their orientation (García Merino and Gillani, 2001: 843-848). These elements might lead us into error, therefore we prefer to work with the traces orientation (Figure 5).

6. HILLOCK BETWEEN THE “WATCHTOWER HEIGHT” AND THE “RESERVOIRS HEIGHT”

It is a transition point between the two heights that form the city. The access to the city during the Iron-Age is probably to have been here, since it is a very narrow strip of land, which can be easily defended. This situation is usual in the II Iron-Age settlements. The exclusively Roman city would start from this point. Some public buildings can be found in this transition sector, maybe because it was the very central and the best located part of the city.

6.1 THE POSSIBLE “*BASILICA*”

It was excavated by Morenas de Tejada in the years 1913 and 1914 (since no plan was drawn, only soil heaps from the old excavations can be seen nowadays); this information was completed by the forum square and temple map, noticed thanks to the aerial photography (García Merino, 1987).

6.2 THE PORCHED ROTUNDA

This concrete structure, which takes advantage of the slope, can be seen perfectly in the site. Firstly it was thought to be a big reservoir, but today it is supposed to be a porched rotunda (García Merino, 1987).

6.3 THE HOUSE WITH THE PLINTHS

This is one of the last excavated areas. It is formed by a house of about 1000 m², which occupies approximately a whole block. Some of the streets surrounding it have also been excavated. Other nearby houses have been partially brought to light. This sector allows us to know the size and orientation of

the streets, which are important data about the city urbanism (Gillani, Vancetti, and García Merino, 1994: 6-13).

7. RESERVOIRS PLAIN

It is a bit complex area, because it is formed by a height larger than the first one we have described and its morphology is more irregular. This area is covered by several aerial photographs, where many building traces can be noticed, but they are difficult to link with each other.

7.1 THE ARTIFICIAL TERRACE

This public construction was built to replace the aforementioned forum. It was partially excavated, it leans against the slope and the so-called “house of the griffins” was erected on it in Late Roman Times.

7.2 POSSIBLE BATHS

On this same height Morenas de Tejada excavated a public building, considered as the public city baths, in 1913 and 1914. Unluckily, as in the case of the basilica, no plan was drawn and nowadays only soil heaps, remains of the old excavations, can be seen.

7.3 THE RESERVOIRS

They are big cisterns with a semicircular layout to keep water. They were excavated and emptied. The evidences of other nearby reservoirs have been identified thanks to the aerial photography.

All this height was built, apart from the excavated areas that we have briefly described, as can be observed in the aerial photographs.

8. PERIPHERAL AREAS: THE CASES OF THE QUARRY HOUSE (8b) AND THE SPIKE HOUSE (8a)

We define this way some sectors of the city located away from its centre, where some archaeological evidences have been found, but since they occupy isolated positions, they seem to adapt to the terrain shape rather than to the city urban layout.

This is the case of two peripheral areas where some significant evidences have been discovered. On the one hand, the so-called “quarry house” (Figure 6), a building located on a projection of the Alto del Castro, very close to a quarry. In the 70’s two checking soundings were opened, because the quarry endangered this area. Afterwards, more evidences, including a section of the walls, were identified thanks to the aerial photography.

On the other hand, the south spike in the reservoir height (Figure 7 and 8). This sector was not excavated, but the aerial photography supplies interesting data about one building designed around a central yard; therefore, it may be interpreted as a private building, adapted to this peripheral area.

In the last two cases it is extremely difficult to relate the buildings with the city urbanism. Because of that, only the layout of the observed buildings will be studied.

CONCLUSIONS

It can be noticed that all we have stated is a posing about how to organize the study of the urban topography of the city of *Uxama Argaela* starting from the available topographical data, made up by the remains detected by remote sensing.

Some satisfactory trials have already been carried out. On an equal basis it has been applied to other sites, as the Roman city of Clunia (Burgos, Spain) (Gillani and Roggero, 2003: 362-367) or the Roman *villa* of Almenara de Adaja (Valladolid, Spain) (Gillani, 2005: 1056-1061). The aim now is to put into practice what has been synthesized about the city of *Uxama Argaela* in the lines above, starting from the previous experience through former works.

The final goal will be the thematic cartography of the detected remains, in order to carry out the appropriate research. The use of a GIS to handle this information has been considered. It is necessary to make some tests to check if this is an effective system for management and research, or if its design and application turn out to be too laborious in relation to the results we seek to achieve.

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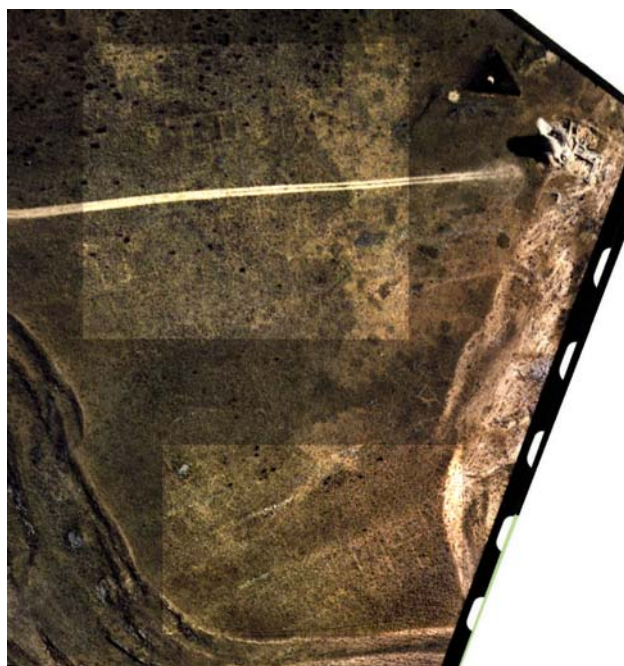


Figure 5: the evidence of the Roman remains on the "watchtower height"

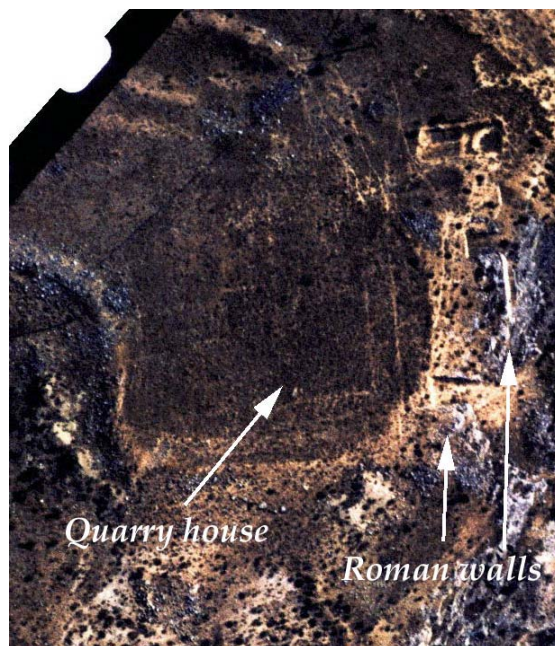


Figure 6: the evidence of the Roman walls and the "quarry house"

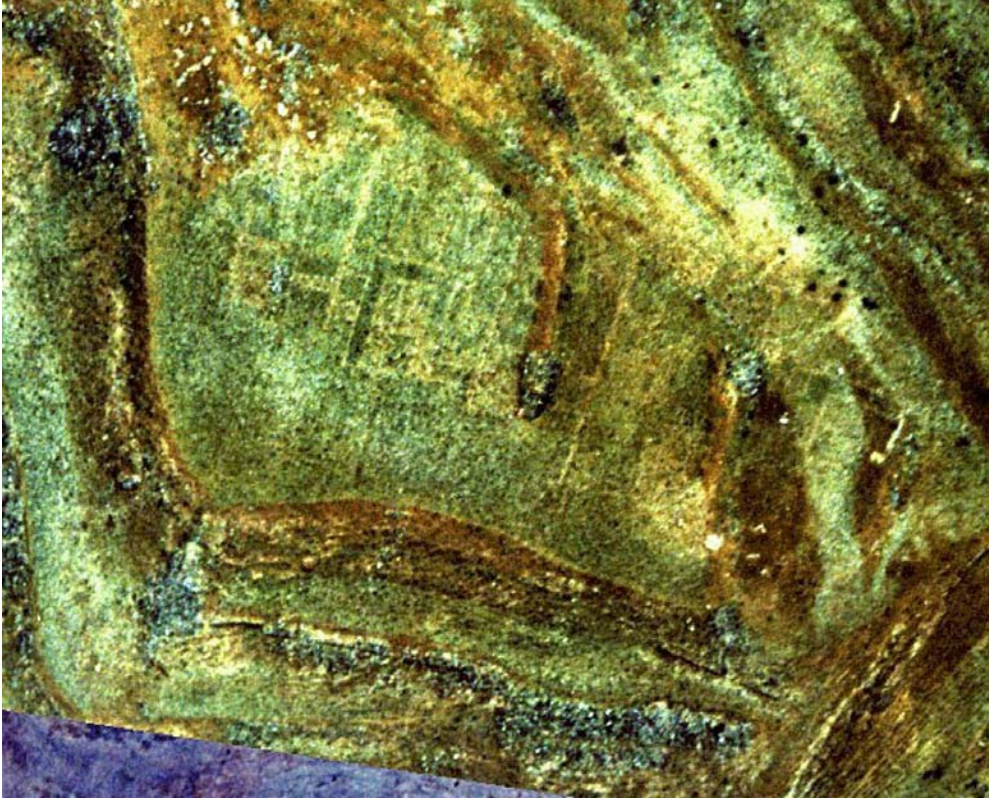


Figure 7: the evidence of the "spike house" and other buildings remains

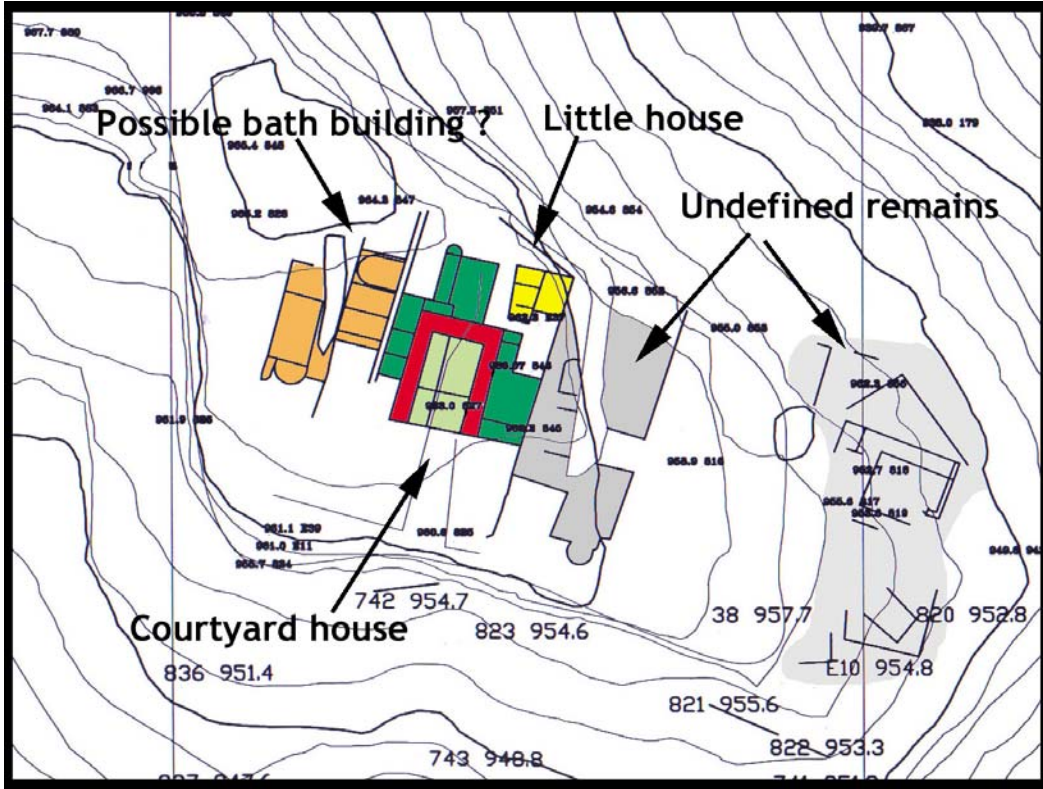


Figure 8: the interpretation of the evidence on the peripheral spike