A picture is worth a thousand words: The first Complutum photograph plan view (Villalbilla, Madrid).

by ARTURO RUIZ-TABOADA and SANDRA AZCÁRRAGA-CÁMARA

Aerial photographs have revealed the street plan of a lost Roman city in the centre of the Iberian Peninsula. This city is regarded as a forerunner of Complutum (Alcalá de Henares, Madrid), located 2 kilometres to the north. It is placed on the top of the hill of San Juan del Viso in Villalbilla, Madrid, and the site occupies at least 30 hectares. This city is the most recent of a number of Roman cities in Europe discovered through aerial photography. The images reveal the remains of a legionary fortress, a street network, dwellings, one temple, and one theatre, among other structures. The discovery of this remarkably well preserved site provides a unique and useful opportunity to make comparisons between two distinct locations of Roman occupation. We suggest that the occupation of the site in the top shows a Republican and Early Imperial city, the pristine city of Complutum. The point is that the municipalisation occurred when the city was in the valley and we can confirm that the Roman urban models, with all kinds of public buildings, were developed in the first Complutum.

Keywords: Lost Roman city, aerial photograph, grid pattern, central Spain, first Complutum

Introduction

After many decades of field and aerial surveys in the Madrid region of Central Spain, the discovery of the orthogonal street plan of a Roman city has allowed for a better understanding of certain aspects of the beginnings of Roman occupation in this area (Figure 1). The use of aerial photographs for identifying archaeological sites has been practised during the last several decades in Spain. Aerial surveys have been central to recording and mapping the landscape of ancient sites, and they have also been utilised on a variety of scales, ranging from the smaller internal distribution of archaeological sites to wider reconstructions of ancient landscapes. Recently, the data offered by aerial high-resolution geo-referenced vertical photographs (henceforth referred to as “orthophotos”) which are easily available on the Internet, as well as satellite images, have become essential to archaeologists. This paper will offer an overview of an ongoing research project focused on Roman urbanism, and it will reflect on the role of aerial survey as part of a broader suite of approaches that can be applied to identify as yet undiscovered Roman cities in Europe.

The photographic analyses of the first city of Complutum have helped to provide insight into the plan of the town as it had existed for decades until the change of location. The Republican and Early Imperial Complutum, with Segobriga (Cuenca, Castilla-La Mancha) and Ercavica (Ciudad Real, Castilla-La Mancha), is one of the only large Roman cities to be discovered in the centre of Spain, and one of the few in Europe that has not been buried by medieval and modern metropolises.

Figure 1 Location map.

During recent years a number of research projects based on aerial archaeology have been undertaken throughout Europe, and they have combined a number of different techniques to better understand the historical landscape, and to locate buried urban structures. For example, the Italian MAPPA project has been used for different purposes by a variety of professionals: for territorial management, basic information, and for future research, such as historical urban studies and excavation surveys (Bini et al. 2012: 129). The area of
study of this project covers over 11,500 hectares including the city of Pisa (Italy), part of the surrounding municipal territory, and also portions of the neighbouring areas of San Giuliano Terme and Cascina.

Looking at how Landscape Archaeology has progressed over the years, it appears clear there is a fast and explosive growth of interest for the potentialities of aerial archaeology as investigative tool. A proof of this awakening of interest is the recent flow of publications all over Europe (Pastor and Adán 2012; Goffredo 2006: 553; Del Olmo Martín 2006; Cowley and Brophy 2001; Griffith and Horner 2000). Vertical aerial photographs, with their wide temporal range, represent an irreplaceable source for the analysis of the Roman settlements. The visibility of buried archaeological traces depends on many factors. Therefore, the degree of visibility of different elements of an archaeological site will vary through time depending on climate, vegetation, agricultural regime, etc. Only repetitive observations conducted over a period of several years will reveal a sufficiently complete representation of the buried archaeology of a region. But still there are areas where aerial archaeology will rarely or even never be successful, as for example built up areas, areas with high alluvium, or forests (Doneusa et al. 2007).

For areas not altered by modern land division and agricultural activities the new results are extraordinary. In absence of sufficient excavation-data, it has already been proved that field survey on its own does not offer enough information to show the complexity of plans and structures of sites; conversely, aerial photography sometimes allows us to easy identify the plan of features buried underneath the ground (Goffredo 2006: 542). Aerial survey allowed us to recognise an area within which the growth of the wheat varied in such a way as to reveal an articulated group of traces that made up the plan of a complex of structures interpreted as a Roman city.

In the last two decades, the increasing development of ground, aerial, and space remote sensing techniques have also focused a great interest in the use of remote sensing for supporting cultural heritage applications. Additional challenges to this field of research are related to the crucial importance of the integration of remote sensing with other traditional archaeological data sources, such as aerial photo, field surveys, trials, excavations, and historical documentation. Thus, the creation of archaeological maps has two main objectives, one scientific, the other politico-administrative. The combination of these two objectives facilitates on the one hand the study of the socio-economic and settlement patterns of the region, and on the other gives us access to public administration processes concerned with development and conservation (Campana and Francovich 2003: 16).

Recent advances in remote sensing and high-resolution imaging have also enabled not only an understanding of the historical landscape for management purposes, but also for the discovery of lost cities like the Republican and Early Imperial Complutum (Spain) and Altinum (Italy). In other cases it has helped to understand the map distribution of cities like Mirobriga Celtorum (Portugal) (Correia 1988), Mucking and Great Bentley (Essex) (Kemble 2001: 22-23), Camulodunum (Colchester) (Hawkes and Crummy 1995), and Roman Corbridge (Colchester) (Hodgson, 2008; Dore 1989). The case of Altinum, discovered in 2009, was unique, and arguably one of the most interesting examples of such discoveries (Figure 2). Archaeologists have known for decades of a Roman trading centre that thrived between the 1st and 5th centuries in that area. But all traces of Altinum’s buildings have long since disappeared, either having been dismantled for building materials, or swamped by rising water levels in the surrounding lagoon. In July 2007, during a severe drought, a team directed by Paolo Mozzi from the University of Padua in Italy took aerial photographs in an attempt to identify the surface remains of the city (Ninfo et al. 2009). Based on these photographs, and the study of variations in plant water stress that they facilitated, it was discovered that the crops planted on the land were in different stages of ripening to those in surrounding areas; this was a result of differences in the amount of water in the soil. Based upon this evidence, they were been able to reconstruct the urban plan of the lost city, locating its main buildings and identifying its urban distribution, thus shedding new light on the historically distant origins of Venice.

One must take into account the huge similarity of the Republican and Early Imperial plateau city of Complutum to the city of Altinum. In both cases the cities were completely abandoned, making them two of the few Roman settlements in Europe not subsequently subsumed by medieval towns. Altinum was definitively abandoned in 7th century A.D. following Barbarian invasions (Ninfo et al. 2009: 577). Its unique spatial
setting has allowed for the reconstruction of the previously unknown urban layout. The first

*Figure 2 Altinun city plan after Ninfo et al. 2009.*

*Complutum* was apparently abandoned in the middle of the 1st century A.D. when the people of the city moved to the plain (Azcárraga Cámara and Ruiz Taboada in press), where this Imperial city can now be visited.

**Background into the first city of *Complutum***

San Juan del Viso is one of the most striking hills on the left bank of the Henares River, upon Alcalá de Henares city, 35 Km northeast of Madrid. In the Roman period, the centre of Iberian Peninsula was known as *Carpetania*. The *Carpetania* region was incorporated into the Roman polity during the first half of the 2nd century B.C. Classical sources tell of how in 192 B.C. M. *Fulvius Nobilior*, praetor of *Hispania Ulterior*, annexed *Toletum*, the most important pre-Roman *oppidum* of the area (Liv., XXXV, 7, 6 and 22, 5). Since that time, there were clashes between different populations of Carpetanians and Rome, which tried to set the northern boundary of the *Hispania Ulterior* in the line of the Tagus. In 151 B.C. the *Carpetania* region appeared, in literary sources, to be a pacified territory which served as a base of operations for the Roman legions during the wars against the surrounding cultures of *Celtiberi*, *Vaccaei*, and *Lusitani* (AP, Iber. 50-52).

At the time of the discovery of this plan city, only two major Roman cities in the *Carpetania* region were known: *Toletum* (Toledo) and the Imperial *Complutum* (Alcalá de Henares). This article shows the origin of the Imperial *Complutum* in the relocation of the Republican and Early Imperial city to the nearby basin of the Henares Valley.

San Juan del Viso hill has traditionally been a focus of attention for historians. By the middle of the 18th century Enrique Flórez identified it as "el primitivo yacimiento de Compluto" at the top of the Hill (Flórez 1751: 163). After him, a lot of scholars have identified the site as the Pre-Roman origin of Alcalá de Henares and others also as the Roman origin.
To date, evidence has been discovered which hints to the Pre-Roman and Roman origins of the settlement on the San Juan del Viso hill, although neither its importance nor the location of the pre-Roman settlement was entirely clear. The only archaeological excavations carried out on this site date back to 1975 and 1978. During these excavations, part of the *hippocaustum* of a bath and a dump with material dated between 60-70 A.D. were discovered (Fernández-Galiano 1984: 32, 55, 73-76). This author thought about the existence of a city on the hill and suggested its move to the valley, probably in Flavian time (Fernández-Galiano 1984; 75-76). Although we have evidence of the existence of the Republican *Complutum* on the Hill of San Juan del Viso (Fernández-Galiano 1976; 1984; Almagro 1994; Polo 1995-1996), until the application of aerial photography, we knew nothing of its size, design, or internal features. This lack of information is also due to the fact that research has been focused only on the Imperial *Complutum* near the Henares River (Fernández-Galiano 1984; Rascón 2004; Rascón and Sanchez Montes 2006; 2007).

In recent years, several surveys have been conducted on the plateau and slopes of the hill (Azcárraga y Contreras 2006). The most recent survey was completed in January of 2012, along with a review of aerial photographs and satellite imaging of the area as part of a developing Doctoral Thesis. As a result we have been able to locate the settlement and characterise the evolution of the settlement pattern from the Late Bronze Age to the construction of the Republican and Early Imperial city. The analysis of this city has illuminated much about the origin, development, and abandonment of this first city, before its relocation to the plain (Azcárraga Cámara and Ruiz Taboada in press). The origin of the city was centralised on the ancient *oppidum* located nearby. This settlement was identified through survey—which showed the accumulation of Pre-Roman pottery in the South of the plateau—and by using the American flight of 1956, where two probable walls were located.

As was the case with Altinum, the results of the aerial photo survey permit a very precise mapping of the road segments and of other interesting archaeological features. In May 2011, the discovery of city map of the first *Complutum* was possible due to the analysis of an orthophoto, by *Plan Nacional de Ortofotografía Aérea* (PNOA) of the National Geographic Institute (Figure 3). The higher resolution of the image (0.5 m/px) significantly improves it. Furthermore, when the picture was discovered, its availability on the Internet through two simple viewing applications, i.e. Iberpix and SigPac, helped to simplify the interpretation of the image. Both applications are developed by Spanish institutions: Iberpix was created by the National Geographic Institute and SigPac by the Spanish Ministry of Agriculture and Environment. Using these tools, it is possible to measure crop marks, which mirror lengths and areas of the urban layout. These organizations update their images every two years; for that reason, at present this 2009 picture can only be found on the archive of Madrid’s local government Institute of Statistics, available online.

The detailed reconstruction of the city's topography was assembled using visible aerial photographs of the farmlands that currently cover the hill. The photos were taken in May 2009 during a severe drought, which made it possible to identify the presence of solid structures beneath the surface. This identification was also possible due to noted variations in the local plant water stress. Despite the use of new remote sensing techniques, the study of temporary variations in crop growth still represents one of the main methods employed in aerial site identification (Brophy and Cowley 2005).

The information available in aerial photographs has been processed with the Adobe Photoshop CS6 image program, which has allowed for identification of those features that are not readily apparent to the human eye. Simple manipulation of brightness and colour-contrast and levels has been used. The area of identified urban features in the orthophoto occupies around 30 Ha, making it possible that the city was even larger, as, when the site is viewed from the air, the apparent lines do not set clear limits, and the area of the plateau of the hill is around 70 Has. This orthogonal grid identifies a multitude of lines that represent the street plan as well as various and their orientation within the city. Appreciable chromatic differentiation in the orthophoto is the direct result of variations in plant water stress. Higher levels of plant water stress are often indicative of the existence of areas of higher compaction of soil in the ground, which we may interpret as the remains of foundations, or as soil of greater consistency (hydraulic floors, mosaics, etc.). The same evidence would also help reveal evidence of cobbled streets. Alternately, those areas that appear dark and inscribed in squares or
rectangles are related with soil of lower density and lower compaction; these areas may perhaps be associated with rammed earth or patios (Figure 4).

Figure 3 The first Complutum orthophoto (San Juan del Viso Hill) and localization of the main buildings: 1. Fortress, 2. Temple, 3. Domus and 4. Theatre (orthophoto by the National Geographic Institute of Spain).

The first city of Complutum: The Republican origin

The discovery of a rectangular structure that seems to be a Roman legionary fortress within this settlement marks the beginning of Roman urbanisation of this hill (Figure 5). This fort measures 145 x 107 m (1.5 Ha), and corresponds to a small garrison not sufficient for the accommodation of a full Legion (Morillo 2009: 243). At least one of its corners appears rounded. This construction is typical of that of Caesar’s time, after the army reforms undertaken by Mario (Johnson 1983: 41; Peralta 2002: 64-66). Therefore, a Caesarean chronology has been proposed for this fort, as the period of civil war between Caesar and Pompey in Spanish territory (49 – 44 B.C.) is the last war period in this area. The existence of this fort could be explained in that it might have served as both a means of passive control and simply as a base of operations in the course of any military campaign. It does not seem that the native inhabitants of the Hill posed any risk at any time, as literary sources do not mention the settlement during the period of conquest.
The plan of the city is oriented around the fort. The city has a grid pattern, at least in the southern sector (Regio South), with several square insulae, and one actus side. This style of urban distribution is consistent with that of the second quarter of the 1st century A.D. It is related to the imposition of Roman cadastral systems (Gabba 1989: 270; Asensio 2003: 167), but became more widely adopted during Figure 4 The first Complutum street plan (San Juan del Viso Hill).
the reign of Augustus (Somella 1988: 150; Asensio 2003: 167). However, there is possible evidence of both square and rectangular insulae. This mixture is very common in other Roman cities, where the orthogonal distribution is not always symmetric (Somella 1988: 242; Asensio 2003: 167). In order to understand the city’s distribution, we have extended the grid of the southern Regio to the entire surface of the plateau, although we have only numbered the cardines and decumani that are clearly distinguished in the orthophoto. The access road to the city is located on the southern slope of the hill (Figure 4).

We suggest that the construction of the city could start from the Caesarean period and continued, at least, during the Augusteum. The foundation date of both the fort and the city is difficult to determine through collected archaeological materials, such as sigillata and common pottery, whether on the surface or from the excavations of the 1970s, due to the fact that most of them belong to the last period of the city occupation, that is, the Early Empire.

The first city of Complutum: The main buildings

The city is laid out in a highly regular grid pattern, with the main cross streets, cardo maximus and decumanus maximus, clearly delineated. These streets were first identified through aerial photography. The cardo has 5 m width, the same as the access road. Decumanus maximus is somewhat smaller, with an approximate width of 3.5 m. The rest of the cardines and decumani range from 3 to 4 m width. The area at the cross of both streets has been interpreted as the Forum, because of a building whose characteristics are similar to that of a temple (Figure 6). The dimensions of this temple are 14 x 8.5 m and the cella, which is the part that is best appreciated in the orthophoto, measures approximately 5.5 x 8 m., with walls of 1.10 m. in thickness. This type of temple is documented in Baelo Claudia (Bolonia, Cádiz) and Regina (Casas de Reina, Badajoz) (Sillières 1997; Álvarez Martínez, Rodríguez and Saquete 2004) during 1st century A.D. In the Complutum of the plain some authors suggest the existence of two twin temples with the same characteristics (Rascón and Sánchez 2009: 180).

The example that best illustrates the alternation of soil compaction is located in the north-central area of the city, where a
assemblage
courtyard surrounded by several paved rooms was located. This structure has been interpreted as a domus (Figure 7). The central peristyle measures approximately 30 x 25.5 m with a courtyard of 13 x 10 m. The distribution and characteristics of the features are very similar to those in the lower Complutum of the valley, as is the case with the “House of the Grifos” (Rascón and Sánchez 2009: 182-194).

We also have to pay attention to a semi-circular structure located at the north-eastern end of the city (Figure 8). It is a building of 40 m in diameter, identified as a theatre. Its location and orientation is deliberate, having been constructed so that it might be seen from the valley, offering a clear statement of political purpose. The fact that it is not located on the slope of the hill is due to the geology of the hill. The hill is formed of an unstable material on a base of limestone conglomerate, which, together with the great inclination of its slopes, especially on the north face, makes it almost impossible to construct a building. The orthophoto allows for the identification of many different features in this area (Figure 8). The darker feature, with two extensions at the ends, could relate to the orchestra. The approximate diameter of the structure is 19 m, and the aditus is 2 m wide. The clearer feature that encircles the orchestra, also semi-circular, is interpreted as the area that would be occupied by the cavea. In addition, the rectangular space with the same contrast, of about 12 m in width, corresponds with the scaenae and the scaenae frons. Its dimensions are consistent with other Roman theatres in the 1st century A.D. such as Regina (Casas de Reina, Badajoz) or Acinipo (Ronda, Málaga), this last one also built on the top of the hill. The similarity to the latter is remarkable, as may be seen in the photo interpretation (Figure 8). Another point in common with Acinipo (Del Amo 1982) is that it is built on a large elevated plateau, although the geological nature of the terrain in this case allows the occupation of a slight slope. Eventually, the theatre of the first Complutum is related with the decumanus V, far away from the city centre, in one of the typical locations for this type of building (Hauschild 1982; Jiménez 1993: 226).

The construction of the theatre may be associated with Imperial propaganda, and we should understand this building in a wider meaning, not only related with play performing but with other uses as contio or comitium. The theatrical architecture began to proliferate during Augustus’s time, but we
should take into account that the urban development in that city could also have taken place later, during Julius-Claudian period, until the Flavian period, where the second city was settled on the Henares riverside.

The analysis of this city, the fort, and the Pre-Roman settlement make us consider an ex novo origin. In addition, its orientation is the same to the Complutum of the plain, which indicates that the centuriation of the adjacent territory was carried out to establish the city on the hill and maintain the city in the plain. There is one more structure of note in this city, a wall or fence perimeter, which defines the Pomerium. It has a symbolic function as well as a practical one, as it separated the urbs from the outer space. However, this element is not readily apparent in the orthophoto. The lack of archaeological evidence of this wall may be due to several causes—most probably because the construction material was wood or mud, or perhaps because all of the stones may have been transported to the new city when it was moved.

The perimeter of the city could be considered rectangular with certain irregularities adjusted to the natural limits of the hill. The urbanism of this city relates to the Ebro basin, where in the second quarter 1st century B.C. many cities were destroyed and many new ones founded, such as Iluro (Mataró), Gerunda (Gerona), and Pompey (Pamplona), after the Sertorian wars. These new cities were part of the process of Roman reorganisation of subjected territories. All these cities were civitates stipendiariae. They were inhabited by indigenous people, and governed by their aristocracies (Asensio 2003: 161-162).

Discussion

The plateau city’s occupation lasted around 100 years, until its transfer to the Henares valley, probably as a result of water needs and the need for better and more convenient communications. The origin of the first plateau city is Late Republican, while the second city of the plain was likely designed between the reigns of Tiberius and Claudius, and finished during the Julius-Claudians period probably under Nero (Rascón and Sánchez 2006: 61).

The population living in the first Complutum was more than likely indigenous, coming from the pre-Roman oppidum and other settlements in the area. However, it should not be ruled out that some Roman families settled there earlier; the area had great advantages. On the one hand, the Henares valley was quite fertile, and it was positioned strategically on an important road network connecting this central area with the Ebro and Guadiana Valleys, which were later the important centres of Emerita Augusta and Caesaraugusta.

With the Emperor’s permission, the old city was dismantled to build the new Complutum on the plain, starting with the public buildings. This spoliation has been archaeologically documented in the baths excavated in 1978. In that excavation, different materials such as tubuli or losanges appeared to have been made ready for transport (Fernández-Galiano 1984: 75). In addition, this excavation led to the discovery of some materials dating to the expansion of the city in the plain. Therefore, the final phase of widespread occupation on the hill of San Juan del Viso would coincide with the transfer of the city to the plain, although it retained a residual population until its final abandonment. This late occupation is evidenced by material found in the survey, such as TSHT or a coin of Constantius II (Fernández-Galiano 1984: 103).

The gradual transfer of the inhabitants of San Juan del Viso and the subsequent growth of the settlement in the plain would be grounds for granting of municipality with the Edict of Vespasian in 74 A.D. It must be remembered that Complutum was one of the most important urban enclaves of the centre of Carpetania, with excellent land and connections to the pertinent communications hub.

The general trend in pre-Roman hilltop settlements is the eventual transfer of its population to plains after its conquest, and this trend proliferated during the time of Augustus. However, we have some examples of cities developed in a similar place, like Toletum, Ercavica or Segobriga. The Complutum case is outstanding. It is not only the later-than-typical change of location, but the fact that a fully Roman city was abandoned in order to build another with much the same characteristics. In this case, we adhere to a theory of urban model diffusion before the Flavian municipalisation in the Henares valley, something unusual in large parts of the peninsular interior (González Román 1997: 46).

This article has shown the archaeological richness of a hill, which, underground, still hides the keys to better understanding the
process of the peninsular interior Roman occupation. We realize that there were tributary cities with urban structures similar to a free city, as Conimbriga or Asturica Augusta (Mangas 1996: 58–59) also in Carpetania. The most important discovery is the confirmation that the Roman urban models were totally assimilated before the Flavian municipalisation in the Carpetania.

Acknowledgements

We would like to thank to numerous friends and colleges for advice and comments on this research, particularly to Enrique Baquedano, Director of the Regional Archaeological Museum of Madrid. We would also be very grateful to Miguel Contreras and Antonio Dávila, from the Regional Archaeological Museum of Madrid. Professors Julio Mangas and Gonzalo Ruiz Zapatero from the Complutense University at Madrid and Professors Concha Blasco and Francisco Blanco from the Autonoma University at Madrid. We also like to thank Neal Brodsky for the comments on the English writing. Finally, we are very grateful for collaborating in the fieldwork to Mario Torquemada, German Rodríguez, Juan Antonio Espinosa y Rebeca Arbizu.

To Neal Smith Brodsky, in memoriam.

Bibliography


1 http://www2.ign.es/iberpix/visoriberpix/visorign.html
2 http://sigpac.mapa.es/lega/visor/
3 http://www.madrid.org/nomecalles/Inicio.icm