Aerial photographs and topographical territorial analysis: some case studies in the Vestine area (Abruzzo).

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Abstract

Data gathered by survey, photointerpretation of historical and recent aerial photographs, archives, bibliography, local bibliography and oral information, give an interesting picture of population settlement patterns in the Region of Abruzzo. Since prehistoric periods, the area along the Royal Sheep Track (Tratturo Regio) has been controlled by hilltop settlements as an ancient commercial route. The settlement pattern, on a local scale, still survives today.

Keywords: Monitoring Flights, Photogrammetric Restitution, Field Survey, Aerial Photographs, Cartography.

The G.I.S. Laboratory for Cultural Heritage (Laboratorio Sistemi Informativi Territoriali per i Beni Culturali) of CNR-IASI, in Rome, is developing a wide-ranging topographical analysis of archaeological areas at risk in the national territory of Italy. The research in Abruzzo is still in progress, with a particular deep focus on the territory of the Iron Age Vestini tribe between L’Aquila and Capestrano, along the route of the Tratturo Regio (Royal Sheep-Track). While much of the information has been gathered from archives (public and private), bibliography, and survey, the majority of the information comes from aerial photographs (both historical and recent). In particular, information has been provided by photographs taken by the author during monitoring flights conducted beginning in 2003 with the Reparto Elicotteri del Raggruppamento Aeromobili Carabinieri di Pratica di Mare and since 2007 with the Sezione Aerea della Guardia di Finanza di Pescara. These flights have provided extremely important new information concerning the evolution of human occupation in the area under examination. The new acquisitions (fig. 1) refer to single sites, necropolis, routes, and traces of various kind of agricultural features and structures (fig. 1 D). Some of this evidence, once identified, has been the subject of sampling and extensive excavations by the Soprintendenza per i Beni Archeologici dell’Abruzzo in regard to conservation and improvement. In particular, there has been very good collaboration with the Soprintendenza, in 2007, 2008, 2009 (the year of the earthquake) and the following years until the present.

In these case studies, the Royal Air Force (RAF) photographs taken during the Second World War are of great utility as they show the territory and environment in a state of preservation that is nearer to that of the ancient world. There have been numerous changes and extensive damage caused by mechanical machinery (ploughs) used to work the fields, by intensive exploitation (quarries and illegal waste disposal), by unplanned or uncontrolled urbanisation, and quite simply by a reduction in (if not a complete removal of) tree-cover (fig. 2 A,B,C,D; fig. 3 A,C).

Some Second World War (1943-1944) RAF aerial photographs of this geographic area (destined to be at the rear of the great Monte Cassino battleground) show, in several strips, fortified hilltop settlements. They have single (as in the Maregelato or Monte di Cerro settlements) (fig. 2 A,B) or double wall circuits. It is often possible to see settlements in pairs, as in the Monte Boria
Fig. 1
A) The Navelli Valley: georeferenced restitution of the traces (in red) from oblique photographs and from Regional Orthophotos. Dashed red lines show the probable extension of each area of the necropolis which also has visible traces but not well defined (in the complete perimeter of the burial) to be clearly drawn on the restitution (georeferenced restitution by P. Tartara).
B) An oblique photograph with traces of different groups of graves marked by the increased growth of vegetation (photo by P. Tartara).
C) An oblique photograph with traces of groups of graves arranged in a circle around an empty space, probably an older tumulo tomb (photo by P. Tartara).
D) An oblique photograph with traces of overlapping agriculural plantings of different kind and historical periods (photo by P. Tartara).
and Colle Campo di Monte settlements (with a common area of necropolis) (fig. 2 D) or the Casale and Colle Restoppia settlements (with a common area of necropolis and a small Karst lake) or in the Colle Santa Rosa I and Colle Santa Rosa II (near Collepietro) (fig. 2 C) and some others.

It is unnecessary to describe the well-known Poggio Picenze necropolis of tumulus tombs located between the settlements of Casale and Colle Restoppia. It was perhaps used for a while by the temporary settlement of Monte di Cerro, but it has to be taken into account when looking at the bigger picture of the burial area. In fact it can be merged with the nearest burial area of Varranone (fig. 2 E) with its hundreds of graves (as seen in different oblique aerial photographs taken during monitoring flights with the Carabinieri Helicopter Group).

Because the regional cartography (at 1:10,000 scale) does not have enough homologous points in common with the archaeological photographs all the oblique air photographs of this area have been georeferenced to the Regional Orthophotos (fig. 2 E). Instead, features such as electricity poles, fences of different kind, piles of stones, trees and bushes which appeared on both sets of photographs were used as points of reference (but excluding those close to the edge of photographs in order to avoid distortion) (fig. 3 A,B).

These better traces were chosen and then precisely transcribed both on cartography and on the Regional Orthophotos with precision (fig. 1 A; fig. 3 A). The same process has been applied to traces of burials of two other large groups of oblique photograms taken during a monitoring flight over the Navelli Valley in August 2013 (fig. 1 A,B,C; fig. 4 C 1-2-3) and near the church of Santa Maria di Centurelli (fig. 2 F) along the valley of the S.S. 17 Road (the last one still a work in progress).

In the Navelli Valley, the burial traces appeared for the first time in 2013. In the oblique photographs and in the Regional Orthophotos many different groups of burial traces are visible, both a fossa and a tumulo (fig. 3 D). Some reports concerning the study of historical and modern aerial photographs with the burial traces of this area have assisted official excavations by the Soprintendenza per i Beni Archeologici dell’Abruzzo and by the University of Chieti.

Several case studies of these kind of necropolis show evidence that in historical periods (at least from the Bronze Age, if not previously, and through the subsequent periods) valley areas were used as common areas for necropolis by different groups or clan of local inhabitants present on small fortified hilltop settlements. The reason of this choice can perhaps be read clearly in the visible traces of the changing path of rivers and the overflowing of their banks (fig. 5 B,D,F). It is reasonable that most of the valley areas were occupied by marshes during part of the year at least and therefore they were not able to be used for cultivation but could be used for burials. On the basis of what is known at present, we are not able to postulate a systematic relationship between necropolis and residential area for many of the settlements.

Today we can see settlements, whether permanent or temporary, scattered along a primary natural route used and institutionalised in successive historical periods. This route would eventually become the Tratturo Regio which, in the fourteenth century, was connected for the length of its route with other major axes permitting the crossing of the territory.

Also, the archaeological evidence tends to cluster in those areas that will later constitute the centres of three stable and populous human settlements, perhaps to be referred in the first instance to three different groups of local inhabitants and that in Roman period will be the cities of Aveia, Peltuinum and Aufinum.

During the High Empire, we seem to witness a slow and progressive diminution in the number of settlements and therefore a reduction in the extensive occupation of the territory. In this period, the major centres of the territory gained additional administrative and economic functions. There is considerable construction, especially during the first century AD (La Regina, 1970; Sommella, 1985-87; 1996) but there is continuity of life at least as far as the middle of the fourth century.
Fig. 2

A) The fortified settlement of Maregelato with a double wall circuit (Tartara, 2007, fig.121).

B) The fortified settlement of Monte di Cerro with a single wall circuit (Tartara, 2007, fig.24).

C) The fortified settlement of Colle Santa Rosa I and Colle Santa Rosa II (a, b) and necropolis (c) (Tartara, 2007, fig.129).

D) The two fortified settlements of Monte Boria (top), Colle Campo di Monte (bottom left) and the necropolis of *tumulo* tombs (bottom right), (Tartara, 2007, fig.124).

E) Burials of a part of the necropolis of Varranone [photo by P. Tartara].

F) Burials of a part of the Necropolis of Centurelli [photo by P. Tartara].
Fig. 3


B) Leporanica: two phases of the medieval settlement overlapping the previous Vestine settlement in a RAF photograph dated May 13, 1944 (Tartara 2007, fig.89).

C) Camponeschi castle: the fortified village inside of the wall circuit. The original phase of the castle is about twelfth-thirteenth century. It shows some phases with restoration and reconstruction, especially made after a very strong earthquake in 1700 (photo by P. Tartara).

D) San Pio delle Camere castle (photo by P. Tartara).

E) Ocre castle: wall circuit with quadrangular towers (photo by P. Tartara).

F) Ocre castle: the last phase with wall circuit with towers and a village inside (it is called "borgo murato") (on the top); the previous phase of the castle, at the beginning of the archaeological excavation (on the bottom) (photo by P. Tartara).

G) The white arrows signal two semaphore towers of the San Pio delle Camere castle and of the Bominaco castle (photo by P. Tartara).
Fig. 4

A) Poggio Picenze: a portion of the Varranone necropolis. Photogrammetric restitution of the traces; different colours have been used for traces coming from different oblique photographs of the same area. This kind of processing supports to the restitution of the more precise traces that will be in red on the final cartography. The density and distribution of burials is particularly interesting. Instead of a cartographic map as a base for restitution an Orthophoto was used contributed by the Ufficio Cartografico della Regione Abruzzo.

B) Other new traces of burials in place name of “Varranone”, on the regional Orthophotos.

C 1) Traces of unknown burials in the Navelli Valley. Like in fig. 4 A, different colours have been used for traces coming from different oblique photographs of the same area, using the regional Orthophotos as the base of the restitution.

C 2) Other unknown traces of burials in the Navelli Valley, from restitution of traces by different oblique photographs.

C 3) Other unknown traces of burials in the Navelli Valley. The traces have been read directly on the regional Orthophotos. The red dotted areas are the edge of areas of tombs that are not so evident in their perimeter and not yet restituted: they can be perceived but not clearly read.

D) Navelli Valley: some other traces of not know burials, visible directly on the regional Orthophotos and not yet restituted.
Fig. 5
A) Municipality of Poggio Picenze. The spread of little modern settlements is an old pattern that still survives in the ancient Vestine area.
B) In place named Varranone, two oblique air photos of the changing path of rivers and their overflowing (photos by P. Tartara).
C) Municipality of Fontecchio. The spread of numerous little modern settlements is an old pattern that still survives in the ancient Vestine area.
D) The valley of the Tirino sources: traces of the changing path of the rivers and their overflowing in an oblique air photo (photo by P. Tartara).
E) Municipality of San Demetrio ne` Vestini and the numerous frazioni.
Late Antiquity and the Middle Ages, lie outside the chronological limits of the research, but it is clear that there was a substantial abandonment of the network of settlements within the territory. Moreover, information obtained from excavations in urban centres indicates the abandonment and spoliation of the monumental public structures but also points to a partial continuation of activity.

Aside from the documentation offered by the literary sources and some religious buildings, it has not proved possible to discern any meaningful presence in the territory on the basis of information gathered during the survey. This state of affairs persists at least until the appearance of castella, occurring in the eleventh and twelfth centuries, and it is also attested to in the subsequent periods by the abundant evidence of monuments throughout the territory (semaphore towers, castles or fortified places for sightings and signaling) (fig. 3 B,C,D,E,F,G).

The ancient Vestini settlement pattern still survives today with small modern settlements, sometime numerous, called frazioni. The modern settlement of San Demetrio ne’ Vestini is a good example of this pattern of settlement with numerous frazioni (San Demetrio, Collarano, Colle, Cardabello, Cardamone, San Giovanni, Villa Grande, and San Demetrio Stazione) that constitute its municipality (fig. 5 E). Of the same kind are the Municipality of Poggio Picenze with the frazioni of San Martino, Villa, Petogna (fig. 5A), and the Municipality of Prata d’Ansidonia that with the frazioni of San Nicandro and Tussio total 408 inhabitants. Often, these frazioni are chosen as the administrative headquarters of the local municipality (figure 5 A,C,E and, not unusually, they are very often antagonistic to each other. Unfortunately, this does not help towards the development or management of the territory or the promotion of tourism!

References


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