

Reading an ancient *vicus* with non-invasive techniques: integrated terrestrial, aerial and geophysical surveys at Aequum Tuticum (Ariano Irpino-Av)

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Archaeological investigations by the Laboratorio di Topografia Antica e Fotogrammetria (LABTAF) of the University of Salento have been carried out in recent years within the frame of the Via Traiana Project. The main goal of the project is a complete topographical reconstruction of the ancient route by means of a multidisciplinary approach including traditional landscape archaeology methodology and other methods, such as geophysical prospecting. The Via Traiana was built by the Emperor Trajan in AD 109 to link Beneventum and Brundisium over a distance of some 320 km (Fig. 1). Much of its route has now been identified thanks to a large number of surveys conducted in the territories of Apulia and Campania (Ceraudo 2008: 9–23).

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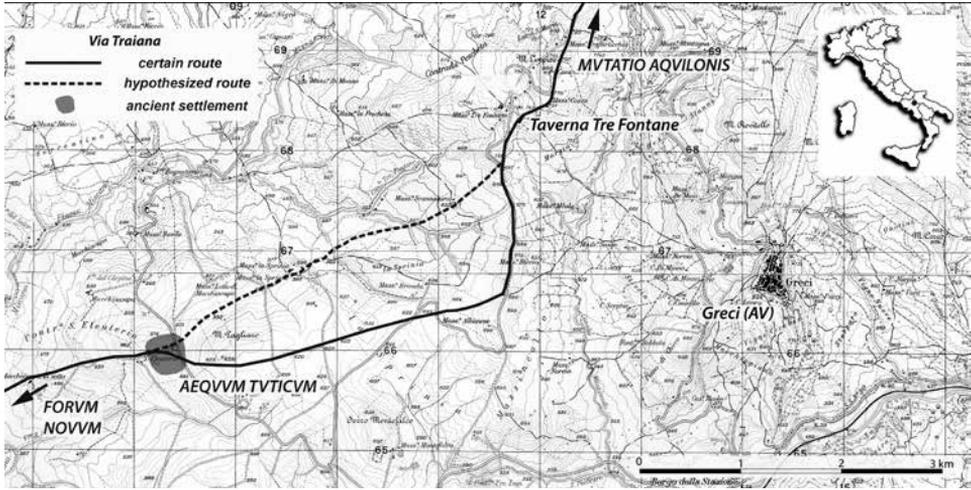


Fig. 1. Route of the Via Traiana crossing Aequum Tuticum, between Forum Novum and mutatio Aquilonis



Fig. 2. Oblique aerial image of Aequum Tuticum: highlighted route of the Via Traiana coming in from the east

The project employed systematic field walking and aerial survey as well as the analysis of multi-temporal and multi-scale aerial photographs. In addition to reconstructing the Roman road, the study has led to the discovery of numerous ancient settlements, ranging in date from prehistory to the Middle Ages. Moreover, the thousands of flights over the territory crossed by the road have enabled the reconstruction of important elements in the organization of the ancient landscape, such as land divisions and minor roads. Also of importance was an analytical study, including 3D reconstruction of all the key bridges along the route and the study of inscriptions relating to it (Ceraudo 2012: 255–256).

Of considerable importance are recent investigations focused on the *vicus* of Aequum Tuticum (modern Sant'Eleuterio countryside, in the Ariano Irpino municipality), conducted in cooperation with the Superintendence of Archaeological Heritage of Salerno, Avellino, Benevento and Caserta Province and the ATS company (Fig. 2). Roman itineraries place Aequum Tuticum along the *via Traiana* between the *stationes* of Forum Novum and *mutatio Aquilonis*, but the site is still not well known (Ferrari 2013: 67). Only two small-scale archaeological excavations, carried out in the 1980s and 1990s, have unearthed a small part of the settlement with attested stratification from the 1st to mid-15th century AD, although literary sources record the existence of a more ancient Samnite settlement in this location (Gennarelli 2011: 42).

The site of Aequum Tuticum was an articulated junction of roads. In fact, since the pre-historic time the area was crossed by the so-called *Pescasseroli–Candela* cattle track. Later, in Roman times the settlement was reached by *via Aemilia*, a consular road (2nd century BC) that linked Aeclanum to Aequum Tuticum, via *Traiana* (AD 109), and via *Herculia*, which starting from the end of 3rd century AD connected southern Samnium to the Lucania region.

Systematic fieldwalking was performed with the aim of defining the site extent and the urban layout system, which appears to have consisted of small and middle-sized residential buildings. The exact location of the necropolises was also important, their presence being documented so far only by occasional finds of funerary inscriptions. In the southern part of the site, about 500 m from the excavation area, numerous fragments of scattered surface pottery attested to the presence of tomb structures, positioned on the side of the *via Herculia*, already identified in an aerial photo. A similar situation occurred in the northern part, about 250 m north of the excavation area, where, moreover, numerous fragments of pottery and other materials led us to suppose the presence of a furnace (some graves attributed to the medieval phase of the town were attested in the excavations). Along the roads, near the urban site and in the environs of the city there are also attested several small- and middle-sized rural settlements, characterized by occupation phases ranging from the Republican to the late Imperial age, confirmed by finds of some bronze coins. Furthermore, about 200 m west of the excavation area, in the courtyard of a private house, several funerary inscriptions from the area of Aequum Tuticum can be seen, chronologically referred to the Imperial age.

Aerial photographs, whether vertical or oblique, can provide an objective and intelligible record of large parts of an archaeological site or landscape, but the results become vastly more informative when combined with other sources of archaeological information, such as excavation, ground-based survey and topographical analysis, and the newer forms of remote sensing. A precise interpretation of all the photo frames has been carried out to extract all the visible archaeological data. Of particular significance for the present study are two flights. The first one was in 1953, performed by the Istituto Geografico Militare; it is possible to reconstruct a long section of the road running from Aequum Tuticum to *Aecae*. The second was part of a regular



Fig. 3. Results of a geophysical magnetic survey performed in the area of Aequum Tuticum

aerial survey carried out between 2010 and 2011, where cropmarks can be recognized as traces of minor roads and there is a long section of the *via Herculia* approaching from the southeast and a section of an urban road that runs east–west, both flanked by buildings. Traces of buildings are also visible to the south of the ancient settlement.

A fundamental contribution came from high-resolution magnetic prospection performed over an area of about 7.5 ha, using a Foerster fluxgate magnetometer equipped with four sensors spaced 0.5 m apart. The instrument was interfaced in real time with a GPS system. Moreover, ground control points were collected by centimetric GPS for better georeferencing. The results from the magnetic survey highlighted anomalies related to ancient roads, main and secondary, and many different structures (Fig. 3). Of interest among these was a large trapezoidal area, probably the Forum square, where two main roadways (maybe *via Traiana* and *via Herculia*) appear to have converged. The magnetic map shows clearly the trace identified with *via Herculia*, oriented NW–SE, which is extraordinarily clear in the southern sector of the map; it is due to its width (about 9 m) and to the presence of many funerary monuments that lie along its route, confirming the location of the necropolis close to the urban area. Moreover, it is possible to observe in the entire investigated area how the buildings have a different orientation in relation to the road network; this opens the way to a number of hypotheses with respect to the diachronic development of the urban center, heavily affected by the crossing of important

roads. The magnetic results also indicated the presence of minor roads, from 3 m to 4.5 m wide, separating the blocks in the *vicus* layout.

In many cases magnetic data are clearly in good correspondence with traces identified in the aerial images and the results of archaeological fieldwalking, proving the huge potential lying in an integration of the outcomes of different methods. Nevertheless, it is important to emphasize that the results coming from each survey can find final validation only in archaeological excavation.

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