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## The Walled Town of Alife and the Solstices

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**Abstract:** Here we consider an astronomical orientation of the walled town of Alife, in Campania. This town has maintained its Roman original layout and the walls of that period. We will show, by means of SunCalc software, that the main street of Alife, its Decumanus, is aligned along the sunrise/sunset on solstices.

**Keywords:** Italic Towns, Archaeology, Solstices, Saturnalia, Archaeoastronomy, SunCalc.

**Introduction** Alife is a town in the province of Caserta, Campania, located in the Volturno valley. The settlement had a Samnite origin. The Romans rebuilt it as an oppidum, Allifae, with the typical layout based on two main roads at right angles, that divided it in four parts [1]. This happened in 80-79 BC [2]. The strong walls that are surrounding Alife are of the Roman time. Remains of an amphitheater are visible outside the walled town.

The Roman Allifae is mentioned in [3]. This reference is considering the Roman centuriation, that is, the Roman land partitioning [4] and the town-planning, and a possible solar orientation of their main axis - the Decumanus - along the direction of the sunrise. The author, Joël Le Gall, argued that there is no evidence of astronomical alignment of the Decumani. To sustain his conclusions, Le Gall considered some examples, and, as previously told, among the examples we find Allifae. « L'ancien bourg samnite d'Allifae a peut-être reçu une deductio à l'époque de Sylla. Nous ne connaissons guère que ses murailles, dont l'appareil en pseudo-réticulé paraît indiquer précisément elles dessinent un rectangle parfait à quatre portes axiales. Les deux directions étaient en dehors de l'amplitude. L'axe principal était de direction 2; cette direction était aussi celle de la Via Latina avec laquelle il se confondait: cette route étant antérieure, c'est elle qui avait dû la faire choisir pour la ville » [3]. About the town, the conclusion of Le Gall is that the Decumanus was aligned along the Via Latina, which was already existing. Giulio Magli, who argued against the thesis of Le Gall in his work on the astronomical orientation of the Roman towns in Italy [5], did not consider Allifae in the list of the 38 towns he analyzed for supporting “that astronomical orientation has been in many cases a fundamental component in the planning of Roman towns”.

Here we will show, using the satellite images and a software which is giving on them the direction of sunrise and sunset on any day of the year (SunCalc.net), that Alife has the Decumanus aligned along the sunrise/sunset on solstices. The fact that the direction of the Decumanus is the same of a preexisting Roman road does not exclude an astronomical orientation of the town.

**Some further information on Allifae** In [2] and in [6], we find some further information about Allifae. The area was populated by the Samnite people of the Allibanos [2]. The town in the 4th century BC was a part of Samnium; after the Augustan redistricting, it became part of Campania. In the first half of the 4th century, the city coined its own money [6]. Later, the town was involved on many occasions in the problems of the Second and Third Samnite wars. Let us remember that the First, Second, and Third Samnite Wars (343–341 BC, 326–304 BC and 298–290 BC) were fought between the Roman Republic and the Samnites. Allifae was reduced to a colony during the second triumvirate (from 43 BC to 33 BC) [6].

The territory of Allifae comprised a large area on the left of the Volturno, bounded by the Titerno and Lete rivers, and the Matese massif (Tifernus mons). Besides occasional finds from the

prehistoric era, there is evidence of a settlement of the Iron Age in the area of Cila, above Piedimonte d'Alife. Many burial places exist over the entire area at the foot of the mountains, the most important of which are near Alife and Piedimonte, dating from the 7th century BC to the Roman era [6]. References [2,6] tell us that the fortification wall at the foot of Mt. Cila were made by the Samnites. Of the Roman period, evidence supports the notion that the population was widely scattered or lived in fortified villages [2].

Alife has a rectangular layout and still preserves a large part of its fortifications (Figure 1). The wall, in limestone opus incertum, with towers and four gates, apparently date to the Late Republican era [6]. Of the same period was the theater. There are also some large funerary monuments from the period between the end of the Republic and the 1st century of the Empire. The amphitheater was placed outside the walls.



Figure 1: Alife in Google Earth.

**The layout of the town** Totally surrounded by the rectangle of the Roman Walls built by Sulla (I century BC), Alife retains the typical urban structure of a castrum, based on two main streets, the Kardo and Decumanus. Today, the Decumanus is coincident to Via Roma - Via Napoli, and the Kardo to Via A. Vessella - Via G. Trutta. They are crossing each other at the central Piazza O. Michi, known as "il Termine". At the ends of two main streets we have the four gates: Porta Beneventana (also named Porta Napoli), Porta Venafrana (or Porta Roma), Porta San Bartolomeo (or the Porta Fiume), and the Gate of the Angels (or Porta Piedimonte). The Kardo and Decumanus divide the town into four quarters, "quarti": Quarto di San Francesco, Quarto del Vescovado, Quarto di San Pietro and Quarto del Castello. The walls are encircling the town with a perimeter measuring  $540 \times 410$  m. Equidistant turrets exist having alternate semicircular and rectangular sections [1].

As we made in some previous papers, let us use a software, the SunCalc.net, to evidence if the town has the Decumanus aligned along an astronomical direction. For instance, in [7-11], we have found that SunCalc (we can make the same using Sollumis.com or the Photographer's Ephemeris) gives the main street aligned along the direction of the sunrise on solstices. The software is easy to use: it shows the lines of sunrise and sunset on the satellite map of the chosen location on the desired day. Using SunCalc for Alife, we have the results given in the Figures 2 and 3.

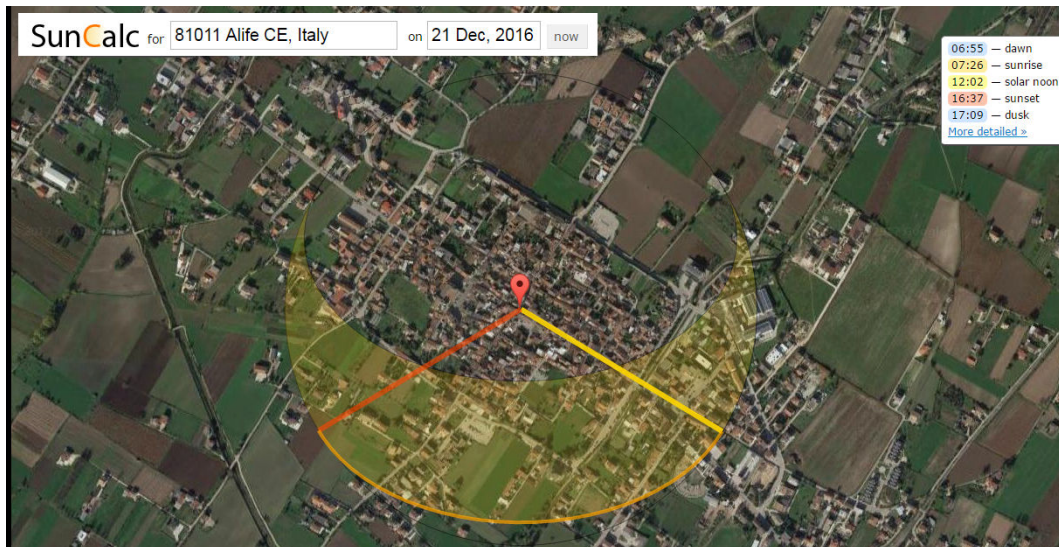


Figure 2: SunCalc applied to Alife, on 21 December 2016.

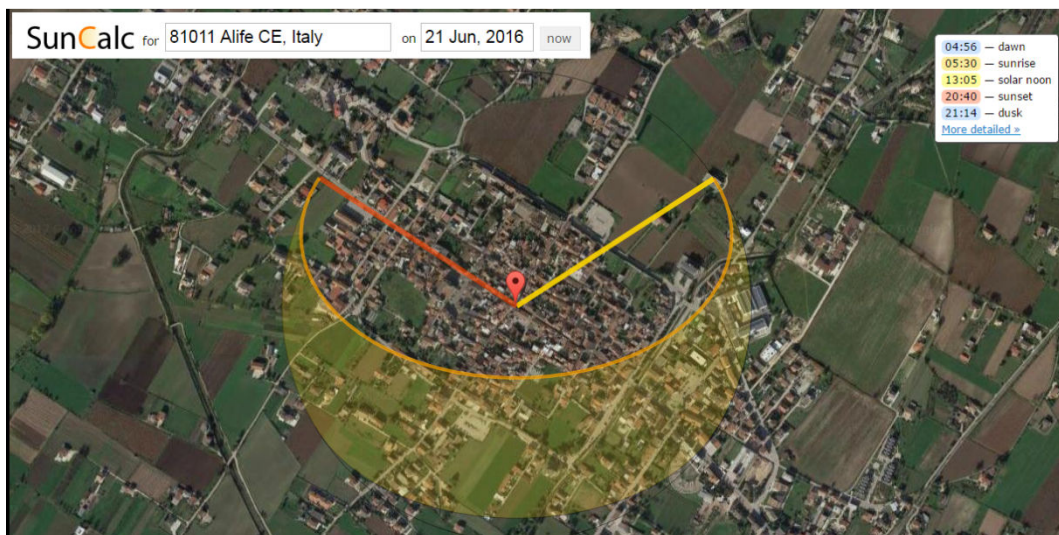


Figure 3: SunCalc applied to Alife, on 21 June 2016.

The simulations in Figures 2 and 3 tell us that the Decumanus is aligned along sunrise/sunset on solstices. Probably, in the rituals of foundation, it was the sunrise having the relevant role, so we can tell that Alife was founded with the Decumanus aligned along the sunrise on winter solstice.

**Foundation ritual** In fact rituals for the land partition and for the foundation of a town existed. About such rituals, let us read some passages of a book written by Francis Haverfield on the ancient town planning [12,13]. When Haverfield discusses the sites of Norba and Pompeii, two towns oriented according to solstices, he tells that evidence exists, which is relating the foundation rituals to “early Rome itself”, and to ancient customs and observances. “These customs belong to the three fields of religion, agrarian land-settlement and war. All three exhibit the same principle, the division of a definite space by two straight lines crossing at right angles at its centre, and (if need be) the further division of such space by other lines parallel to the two main lines” [13]. In this subdivision of the land, the “limitation”, the Romans involved the augurs, the persons practicing augury, able of interpreting the will of the gods by studying the flight of birds. “The Roman augur who asked the will of Heaven marked off a square piece of sky or earth - his templum - into four quarters; in them he sought for his signs. The Roman general who encamped his troops, laid out their tents on a rectangular pattern governed by the same idea. The commissioners who assigned farming-plots on

the public domains to emigrant citizens of Rome, planned these plots on the same rectangular scheme - as the map of rural Italy is witness to this day” [13]. In fact, we can see this scheme in the satellite images of the Pianura Padana [4].

Haverfield continues: “These Roman customs are very ancient. Later Romans deemed them as ancient as Rome itself, and, though such patriotic traditions belong rather to politics than to history, we find the actual customs well established when our knowledge first becomes full, about 200 BC. The Roman camp, for example, had reached its complex form long before the middle of the second century, when Polybius described it in words. Here, one can hardly doubt, are things older even than Rome. Scholars have talked, indeed, of a Greek origin or of an Etruscan origin, and the technical term for the Roman surveying instrument, groma, has been explained as the Greek word 'gnomon', borrowed through an Etruscan medium. But the name of a single instrument would not carry with it the origin of a whole art, even if this etymology were more certain than it actually is” [13]. From these words, it is clear the Haverfield’s opinion on the rituals concerning the limitation. They had origin in the Italic people, not necessarily from the Etruscan rituals.

Haverfield explains that, when “the Roman antiquary Varro alleged that 'the Romans founded towns with Etruscan ritual', (oppida condebant Etrusco ritu), he set the fashion for many later assertions by Roman and modern writers. But he did not prove his allegation, and it is not so clear as is generally assumed, that he meant 'Etruscan ritual' to include architectural town-planning as well as religious ceremonial. These are Italian customs, far older than the beginnings of Greek influence on Rome, older than the systematic town-planning of the Greek lands, and older also than the Etruscans” [13]. Let us note that, since the Etruscan ritual of land subdivision was based on the correspondence of the subdivision of the sky in four main parts [14], and further into sixteen sectors, where each section was under the protection of a specific deity, this ritual seems not so different from Haverfield’s ritual of Italic people concerning the land limitation.

There was - Haverfield continues - an ancestral heritage of the Italian tribes, at the origin of customs and rituals. Probably, these customs were more secular rather than religious. “They took their rise as methods proved by primitive practice to be good methods for laying out land for farming or for encamping armies. But in early communities all customs that touched the State were quasi-religious; to ensure their due performance, they were carried out by religious officials. At Rome, therefore, more especially in early times, the augurs were concerned with the delimitation alike of farm-plots and of soldiers' tents. They testified that the settlement, whether rural or military, was duly made according to the ancestral customs sanctioned by the gods” [13]. It may be asked how all this applies to the planning of towns. “We possess certainly no such clear evidence with respect to towns as with respect to divisions agrarian or military”. But, as Haverfield observes, the Roman town-plans show very much the same outlines as those of the camp or of the farm plots. This outline of the urban planning, according to Haverfield, “it may well be called Italian”.

“We need not hesitate to put town and camp side by side, and to accept the statement that the Roman camp was a city in arms. ... Whether the nomenclature of the augur, the soldier and the land-commissioner was adopted in the towns, is a more difficult, but fortunately a less important question. Modern writers speak of the *cardo* and the *decumanus* of Roman towns, and even apply to them more highly technical terms such as *striga* and *scamnum*. For the use of *cardo* in relation to towns there is some evidence. ... The silence alike of literature and of inscriptions shows that they were, at the best, theoretical expressions, confined to the surveyor's office” [13].

**Saturn and the winter solstice** For Alife, we can repeat what we have already mentioned for Norba [11]. In the framework discussed by Haverfield of an Italic ritual, we find an augur who was asking the will of Heaven by means of a space on earth - the *templum* - divided into four quarters (Alife is in fact clearly divided in quarters). For the orientation of the *templum*, it is possible he used, besides the local morphology of the site, also the astronomical phenomena, such as the rising of the sun. In the case of Alife, it seems that the augur linked the site to the winter solstice.

For Romans, the winter solstice was very important. The week about this solstice was a period of the great celebrations (Saturnalia) of the god Saturn, the agricultural deity who reigned over the world in the Golden Age. Saturn was also identified by the Romans to the Greek Kronos, the god of time [15]. During the Saturnalia, the goodwill of this Age was restored for seven days. All business and military operations were postponed and people made exchange of friendly visits and gifts. Since Alife was built at the center of a fertile plane, it is probable that the orientation of the town along the sunrise on the winter solstice, was decided by the augurs as an homage to the god Saturn, who was the ruler of the Golden Age.

**The town and the Roman road** As we told in the introduction, when we mentioned the work of Le Gall, the fact that the direction of Alife's Decumanus is the same of a preexisting Roman road does not exclude an astronomical orientation of the town (and then of the road). As we can see by the map in Figure 4, roads are adapted to the local terrain. If we suppose that Via Alcide De Gasperi is following the ancient Via Latina, we have that it is bending to pass across Alife. The town is the center of the largest part of the plain shown by the map. It means that the town was also the center of a centuriation, or that the Roman road was the main road of a centuriation. If the town was adapted to a preexisting centuriation, it means that we could ascribe the observed astronomical orientation to this centuriation.

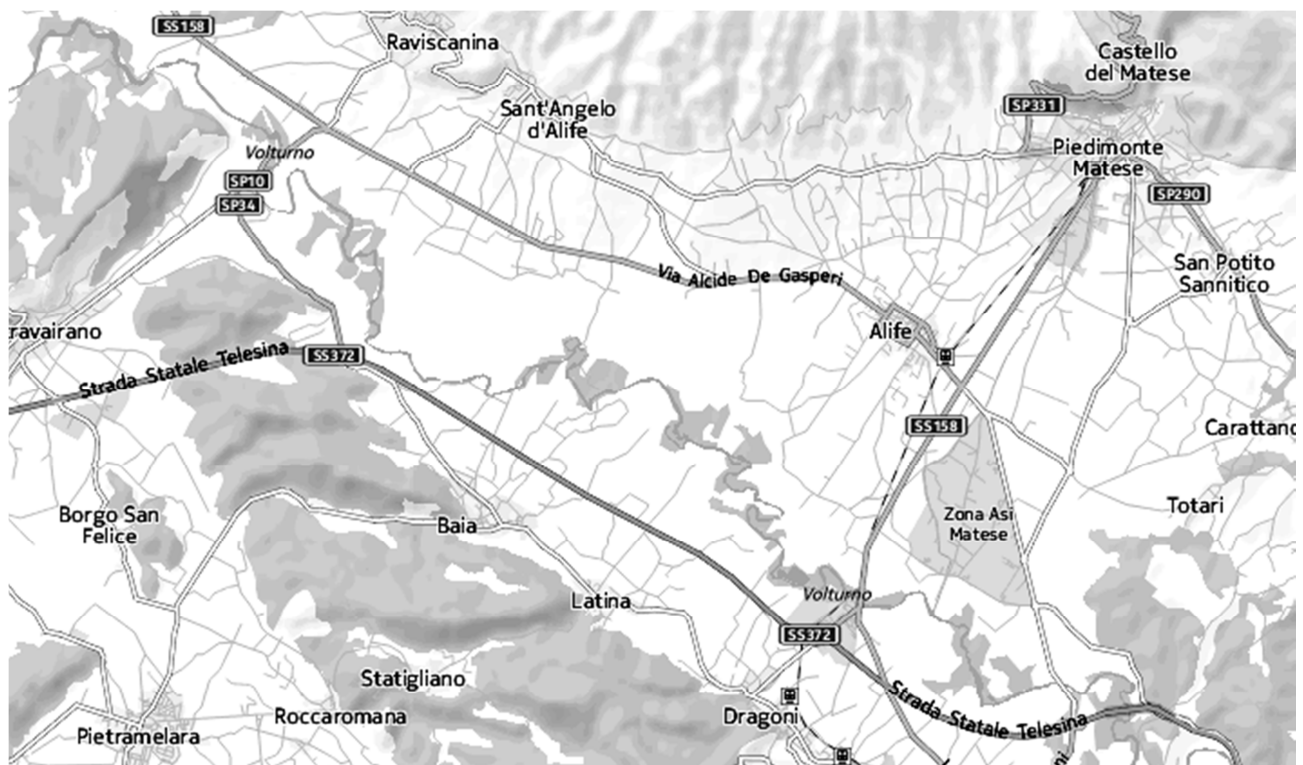


Figure 4: Map of the roads (Courtesy HERE Map).

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- [11] Sparavigna, A. C. (2017). The Ancient Norba and the Solstices. SSRN. DOI: 10.2139/ssrn.2895354
- [12] Francis John Haverfield (1860–1919) was a British historian and archaeologist. He studied at the University of Oxford. In 1884, he became to work at Lancing College. He used the time free from duty to pursue researches about the Roman Britain. In 1892 he returned to Oxford and for the next 15 years he resided at Christ Church as student and librarian. During his vacations he travelled visiting numerous Roman sites. In 1907, he became Camden Professor of Ancient History at Oxford. His works include *The Romanization of Roman Britain* (1905), *Ancient Town Planning* (1913), and *The Roman Occupation of Britain* (1924), and many monographs. Information from the site <http://www.nationalarchives.gov.uk/nra/lists/GB-0479-Haverfield.htm>.
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