



## POSSIBLE ASTRONOMICAL REFERENCES IN TWO MEGALITHIC BUILDINGS OF ANCIENT *LATIUM*

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### ABSTRACT

In the wide area of the ancient *Latium Vetus* - roughly enclosed within the coast and the Apennines between Rome and Terracina, in Central Italy - there are several examples of town's walls and buildings constructed with the spectacular megalithic technique called *polygona*, in which enormous blocks are cut in irregular shapes and perfectly fit together without mortar. In many cases, for instance in Alatri, Arpino, Circei, Norba and Segni, the megalithic size of the blocks and the ingenuity in construction reach the same magnificence and impression of power and pride which characterize the worldwide famous Mycenaean towns of Tiryns and Mycenae, constructed around the XIII century BC. In Italy however, all polygonal walls are currently attributed to the Romans, and dated to the first centuries of the Roman republic (V-III century BC), although for most of these constructions no reliable stratigraphy is available. In the present work, which is part of an ongoing project aiming at a complete study of these buildings, we investigate the possible astronomical references in the planning of two among the most imposing of them, namely the so called Acropolis of Alatri and Circei.

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**KEYWORDS:** Latium Vetus, megalithic buildings, archaeoastronomy, Acropolis of Alatri, Circei

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## INTRODUCTION

Polygonal walls are huge walls of megalithic blocks cut in polygons of irregular shape and joint together without the use of mortar. Many walls of this kind were constructed by the Myceneans during the Bronze Age; in some cases, their defensive purpose is clear, for instance in the fortified site of Gla in the Copais region, in other cases the "towns" were actually small in size and were originally lacking of sufficient resources of water. In such cases, the citadels were more likely symbols of pride and power of the warrior aristocracy which was inhabiting them (Scully 1962); this is the case of Mycenae and, especially, of Tiryns, although at the end of the Mycenaean civilization (around the XII century BC) both settlements were extended and provided of water reservoirs, thus showing new needs of defensive character (see e.g. Castleden 2005).

Definitively less known, but equally impressive and magnificent, are the polygonal walls visible in many Italian towns, spread into an area which is centred in the *Latium Vetus* (essentially today's Lazio, with regional capital Rome) and extends in the whole western side of central Italy from Umbria to Campania. All such towns make their first appearance into the written history through the works of the Roman historians (for instance Livius) when their conquest by the Romans is mentioned; sometimes, after the conquest a "deduction" of a colony followed as well. Before the Roman conquest however, the ethnic scenario of Latium was extremely complicated. Indeed, the region was inhabited not only by the many Latin tribes (including the Romans) but also by many other populations of uncertain origin, each one with his own culture, in active cultural and trade exchanges with the Etruscans and

the Mediterranean area. For instance, the southern zone was inhabited by the Hernics and by the Volscians, and it is actually ascertained without doubts that in most cities of this area (such as for instance Alatri, Arpino and Ferentino) *settlements* existed already at least in the VIII-VII century BC, if not before. As a consequence, the builders of the polygonal walls of such towns and of many others have *not* been identified with certainty. Up to the beginning of the 20 century, most scholars were even convinced that the walls - technically identical to those made by the Myceneans - dated to the Bronze Age, and that the polygonal technique came in Italy with the alleged migration of a people called the Pelasgians, to which many historians (starting from Herodotus) refer. However, no material proof of this idea was (and is) available, and some scholars consequently proposed to lower drastically the date of construction of as much as one thousand years, to the period of the Roman expansion. A few investigations of "stratigraphy" were then made in 1905 in one site, Norba, "without finding any pottery different from those which are commonly viewed in the Roman ruins". In spite of such questionable foundations, it became a dogma since then, that the polygonal walls in Italy were made by the Romans. Since, however, not even one polygonal joint is visible in the whole monuments and walls in Rome, scholars had to admit that the use of this technique was, for some reason, "restricted to the colonies" (see e.g. Lugli 1957, Adam 1994).

All in all, it is today believed that the town walls were constructed by the Romans in the occasion of the conquest, and therefore that the dates of such a conquest reported by the historians *coincide* essentially with those of the walls. The

problem of testing such an assertion is quite intricate and involves the interpretation of the Roman sources on architecture, especially, of course, Vitruvius; these essays are extensively discussed in a companion paper to which the interested reader is referred to (Magli 2005). Here, I will only mention that the idea that the walls date to the Roman expansion period is in clear contrast with the following fact: it has been recently shown that Rome had his first circle of walls on the Palatino hill at the end of the VIII century (Carandini 1997); thus, if the walls of the towns which were to become enemies of the Romans – for instance, the Hernic towns Alatri and Ferentino – were constructed four centuries later, this would imply that the Romans started to conquer the world from their impressive walls (of course, made out of squared blocks) while people as proud as the Hernics and the Volscians were waiting for them without fortifying their own towns. All in all, therefore, without necessarily resort to alleged people bringing Mycenaean technology in Italy at the end of the Bronze Age (an hypothesis which cannot, in any case, be cancelled from scratch, since Mycenaean pottery is very well documented in many places in Italy) it seems reasonable to tentatively attribute most of the walls to the period in which Rome was endowing itself of defensive walls. This idea implies a shift in the dating of these buildings from the early Roman republic (V-III century b.C.) to the full Iron Age (VIII-V century b.C.). Unfortunately, in order to check any hypothesis about dating of these monuments, it is impossible to apply a stylistic/structural analysis to the building's technique, because the polygonal technique was passed on in some manner during the Hellenic Dark Age, and re-utilized in classical antiquity; for instance, it is visible in the famous wall of the Delphi

sanctuary of Apollo, dated around 520 b.C., as well as in many Greek and Roman colonies. It is worth noticing that, recently, a thermo-luminescence method which allows the dating of the time at which a stone belonging to a wall has been cut and exposed to sunlight for the last time has been developed, and applied to various buildings in Greece, including the polygonal wall at Delphi (Liritzis 1994, Liritzis et al. 1997); it would thus be worth the application of such a method in Italy in the near future as well. In the meanwhile, and in parallel with this, I will present here the results, coming from two relevant case-studies (the Alatri and Circei Acropolis), of an ongoing investigation on polygonal buildings based on archaeoastronomy. The idea here is to investigate about the *knowledge* – or perhaps one should say the *lore* – of astronomy that the builders incorporated in their constructions, in order to gather information on their culture and identity.

## THE ALATRI ACROPOLIS

Among the megalithic towns in Italy, perhaps the most enigmatic and beautifully preserved is Alatri. The city is surrounded by as much as 3 kilometres of polygonal walls, and is characterized by the presence a peculiar structure, usually called Acropolis (Fig.1). It is a huge "citadel" (comparable to Tiryns in dimensions) which lies, virtually intact, on a hill at the center of the town. In some sectors, the walls of this building still rise up to 15 metres high, and the joint between the blocks is so perfect that one cannot insert even a single sheet of paper between two of them. Usually, the construction of this megalithic structure is attributed to the Romans, and dated around the year 300 b.C., when, according to Livius, the Hernics were defeated (see e.g. Lugli 1957).

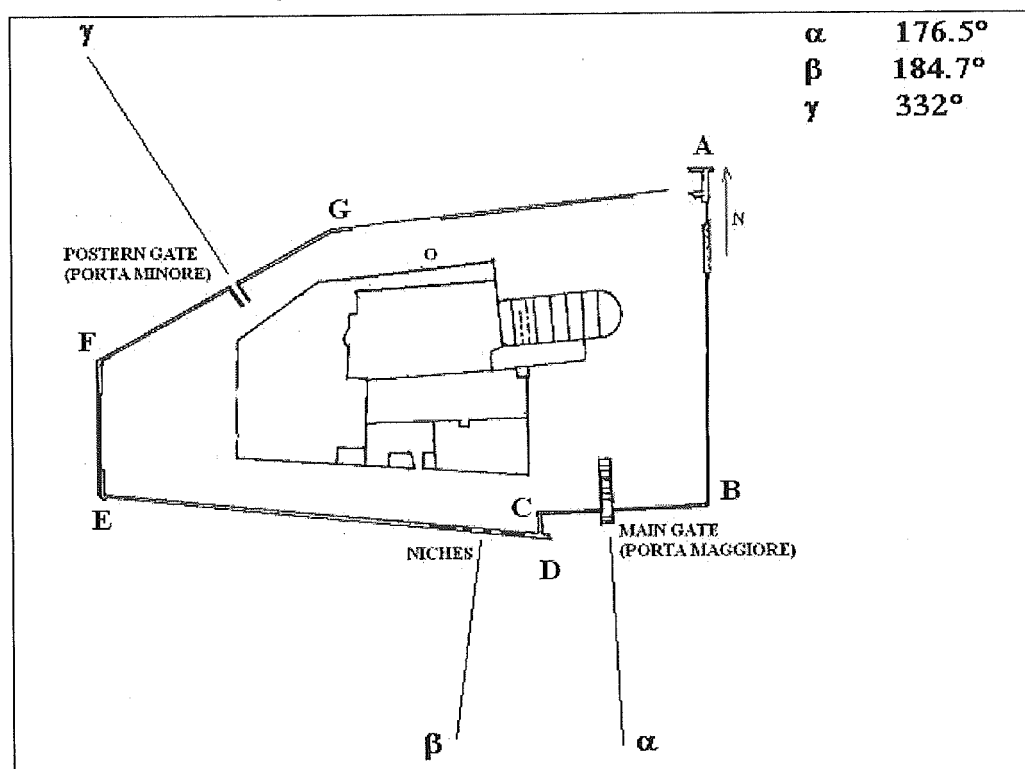


Fig. 1 Plan of the Alatri Acropolis (adapted from Capone 1982). The azimuths of the possible astronomical alignments are reported (see text for details).

The citadel has only two entrances, a major gate or *Porta Maggiore* (the lintel is a 24 tons, 5x1x1.5 meters stone) and a postern gate (*Porta Minore*) on the opposite side, as in Tiryns and in Mycenae. The Acropolis is free of inscriptions of any kind, and the unique signal which was left by the builders is a symbol composed by three phalli disposed as to form a "T-shaped" – or cross-shaped - image. This symbol is still clearly visible (although damaged in antiquity, probably as a pagan symbol) on the lintel of the postern (Fig. 2a,2b). Further to this, on the opposite side of the building at the ground level, there are three huge "niches" (some two meters high and one meter large). These niches are beyond any doubt contemporary to the walls and

were constructed with much efforts, because each one has to sustain the overlaid wall and therefore is endowed with a huge lintel; they have no structural function and look as if they were lodges for statues, which are, anyway, long lost.

On the top of the hill, inside the Acropolis, a further megalithic structure lies on a natural platform of rocks. It was perhaps the basement of a temple, or of a palace, but, during the Middle Age, the Alatri Cathedral was built on it, and today only the northern side of the original building is still visible, at the foundations layers of the church. However, it remains enough to check that the basement was constructed with enormous stone blocks perfectly joined together; in one point

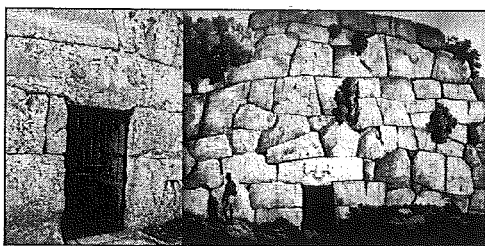


Fig. 2a-2b On the left, a photograph of the Postern Gate of the Alatri Acropolis nowadays. The "T" shaped symbol is still discernable on the lintel. On the right, a 18 century drawing of the same gate, when the symbol was more clearly visible.

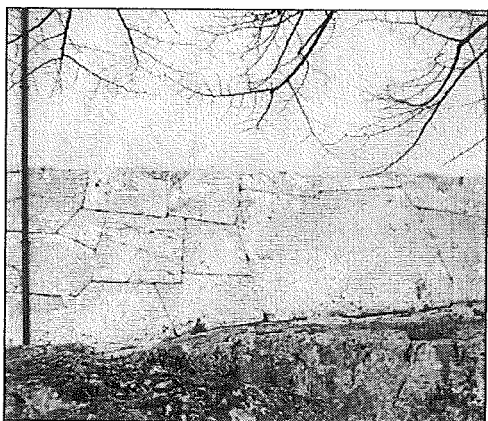


Fig. 3 Alatri Acropolis, the north side of the megalithic basement. At the ground level we see the rock-cut foundation of the blocks, with the fissure on which the "point O" is located. Over it, the perfect polygonal masonry, with, on the right, one of the hugest blocks ever set in Alatri, more than 2 meters long and 2 meters high, cut with nine corners. The polygonal masonry was later used as foundation of the wall of the Church which stands over it.

(indicated by "O" in Fig.1) a huge 2x2.5x1 meters megalith was cut with *nine* corners and then joined with other eight blocks (Fig.3); just behind this megalith a natural fissure of the rocks might have been used as foundation deposit for the city. It was indeed discovered by the local historian Giuseppe Capone (1982) that the layout of Alatri was planned on the basis of

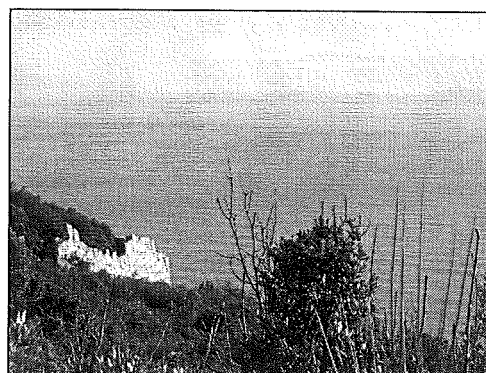


Fig. 4 The polygonal walls of the Circei Acropolis emerge from the woods

geometrical and astronomical alignments which start near the point O: indeed ideal straight lines connect the gates of the city on opposite sides of the Acropolis at the same distance from O, and the line connecting O with the north-east corner of the Acropolis points to the rising sun at the summer solstice (Capone's findings were later confirmed in a joint paper with A. Aveni, see Aveni and Capone 1985).

## THE CIRCEI ACROPOLIS

The stone structure usually called the Circei Acropolis is one of the most enigmatic megalithic buildings in Italy (Fig. 4). It lies, abandoned to the woods, on the south side of the mountain which forms the edge of the Circei promontory, in the southern part of Lazio (tradition identifies here the house of the witch *Circe* of the *Odyssey*). The acropolis has the form of an irregular polygon, of some 800 meters of perimeter and 2 hectares of area (Fig. 5); it has a well-preserved gate on the north-west side (this gate was covered by a huge lintel which today lies nearby). As in Mycenae, Tiryns and Alatri, there was probably also a postern gate located on the opposite side, of which however scarce traces remain (Calzecchi Onesti & Tamburini 1981).

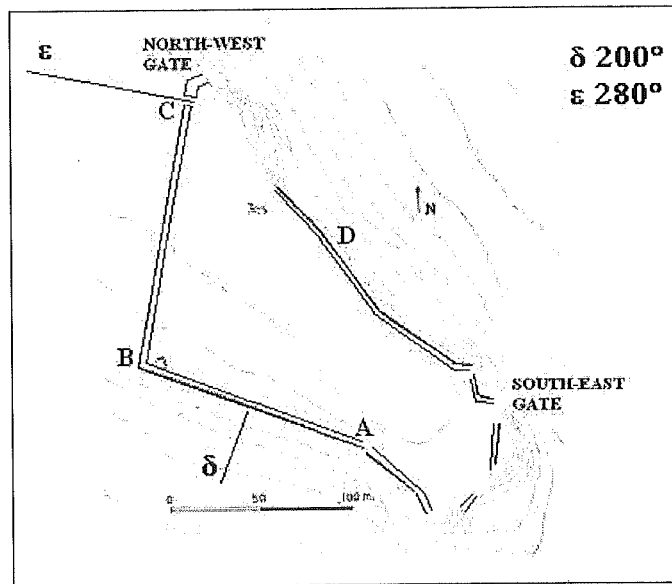


Fig. 5 Plan of the Circei Acropolis (adapted from Calzecchi Onesti and Tamburini 1981). The azimuths of the proposed astronomical alignments are reported.

The polygonal masonry of the structure is simply perfect on the exterior side and still rises to some 7 meters, while the interior, constructed as a double curtain of blocks with filling in between, is more rough. In any case no signal, no inscription, *nothing* has ever been found saying something about the builders; no excavations have been carried out, and the unique known structure within the area is a curious vaulted cistern which is reported as being constructed with the “tholos” technique (the cistern is not accessible today).

Under the hill, on the southern slope of the promontory near the sea, lies the city of San Felice Circeo, which corresponds to the Roman colony Circei “deducted”, according to Livius, at the end of the king’s period (around 500 b.C.). Although no one among the Roman historians cites the existence of the megalithic structure on the hill, most archaeologists tend to identify it as a “fortified enclosure” constructed by the

Romans, at the time of the colony or more probably later, when a second “deduction” was made here in 393 b.C. (see again Calzecchi Onesti & Tamburini 1981 and references therein). However, although the position of the building is optimal for long-distance control of the sea behind, the interpretation as a “fortress” looks hardly compatible with the fact that the *top* of the hill was not included within the walls: the hill actually overlooks the enclosure from a position ideal for the enemies (no traces of further fortifications have ever been found on the top). Thus, also the Circei Acropolis might have been conceived, at least originally, for symbolic reasons, and one may suspect also here the possibility that this place was “a place of pride and power”: for instance, with its huge blocks of limestone perfectly cut and joined, the Acropolis was (and still is) clearly and brilliantly visible at great distances from the sea.

## THE POSSIBLE ASTRONOMICAL ALIGNMENTS

The plan of the two buildings under study is in itself polygonal, and it was actually noticed that the plan of the Alatri Acropolis somewhat resembles that of the constellation Gemini, which hosted the summer solstice in the first millennium b.C. (Capone 1982, Aveni and Capone 1985). Of course, this may be due to a chance; in any case, a close inspection of both the Alatri and the Circei monuments shows that – apart perhaps for the east sides of the Circei Acropolis, see below – their polygonal contour was *not* due to the morphology of the rocks: it was, on the contrary, obtained cutting huge layers of stone whenever required. Clearly, it is difficult to attribute the choice of these layouts to strategic reasons, and actually, as is well known, the standard form of the Roman military enclosure since the V century b.C. was the same as that of the Roman cities, namely the so called *castrum*, a squared-plan structure criss-crossed by two main streets.

As a consequence, it arises the possibility that the plan of the Acropolis might have a symbolic meaning. Our aim here is to investigate if this meaning can be connected to astronomy, as occurs for many imposing megalithic structures, such as, for instance, the Nuraghes of Sardinia and the Taulas of Menorca, constructed during the period 1500-700 b.C. *circa*. To this aim, I have collected the azimuths of the sides of the Alatri Acropolis which are in their original state (namely, all sides shown in Fig. 1 except G-A which was rearranged with the addition of a ramp) and of those sides of the Circei acropolis which are currently reachable for direct inspection (sides A-B and B-C); all data reported below are obtained with a precision magnetic

compass taking into account magnetic deviation; a safe esteem of the maximal error is  $\pm 1^\circ$ , which is sufficient for our purposes here although, due to the perfect state of conservation of the monuments, the sites certainly deserve the use of high precision relief techniques in future work.

A immediate hint to astronomical orientation arises from the fact that the east and west sides of the Acropolis of Alatri (A-B and E-F in Fig. 1) are fairly well oriented on the meridian, with a deviation of 0.5 degrees west of north and of 0.8 degrees west of north, respectively. This orientation was probably obtained with a solar method, as the above mentioned orientation to summer solstice sunrise of the line O-A seems to confirm. Having fixed two sides in this way, the builders did *not* construct the remaining ones following straight lines: indeed both present one “bent”, resulting in a total of four sectors. Of course, a astronomically oriented building may have been aligned in such a way that the astronomical indicators where the tangents to the walls, as it occurs for the Nuraghi of Sardinia (see e.g. Zedda 2000), or – and this is the most common case – in such a way that the line of sights of the astronomical bodies at the horizon where orthogonal to the walls, and individuated by architectural features such as gates/corridors or windows. This is the possibility we shall investigate here.

To inspect further astronomical references in the Alatri Acropolis, we consider the azimuths defined by the directions of sights from the corridors of the two gates and from the niches towards the horizon. These azimuths were pointing to a quite peculiar configuration of bright stars in the sky. Indeed, during a period of some months which includes the winter solstice and the spring equinox, the following was visible in the night sky over Alatri: the line “collimated”

by the postern gate (denoted by g in Fig. 1) was pointing to the setting of the bright star Capella and, *at the same time*, the two lines of sights defined by the main gate and by the niches (denoted by a and b in Fig. 1) were pointing towards the region very close to due south, were the bright stars of the Crux-Centaurus asterism (which, as is well known, was considered as a single constellation in antiquity) formed a bright arc, low in the sky. This "arc" was composed by the bright star Hadar "collimated" by the corridor of the main gate and, on the other side, by the stars of the Southern Cross. The time interval of validity of such precession-dependent alignments depends, of course, on how much error is allowed for, but can be reasonably assumed between 700 and 400 b.C.

To investigate on the possible astronomical references of the Circei acropolis, it is worth making the following observation. It is clear from inspection that the south-west and north-west sides (A-B and B-C in Fig. 5), which run perfectly straight and look towards the sea, could have been built with any chosen orientation, without serious constraints arising from the morphology of the rocks below. Once again, therefore, their orientation might have been dictated by astronomical considerations. Whether it is by chance or not, it turns out that the line (denoted by d in Fig. 5) orthogonal to the south-west side (A-B) points to the setting of Crux, while the line (denoted by e) orthogonal to the north-west side (B-C) and directed as the corridor of the main gate points to the setting of the bright star Aldebaran. Both these alignments hold within (roughly) the same window of validity of the alignments in Alatri (700-400 b.C.).

As mentioned before, most of the sectors

of the Circei walls which look towards the country – indicated schematically by "D" in Fig. 5 – are today not accessible, due to the woods and the cliffs. In any case, their layout was, at least in part, obliged by the rock layers of the hill. Further, these sides show (at least in existing maps) one or maybe two small bends and, in addition, the horizon from here waits to be relieved. Thus, I only mention at the level of a possibility, that the gate in the east sector may have pointed to a region where the rising of Gemini occurred (around azimuth 50°) during the same period.

## DISCUSSION

The above results indicate a likely astronomical content in the planning of the megalithic buildings of Alatri and Circei. Is it possible to confirm these astronomical connections from independent sources? There are no written documents, however one can observe that the phallic symbols on the lintel of the Alatri Acropolis are arranged to form a T-shaped or cross-shaped figure. Although "fertility symbols" were common in the Mediterranean Area (for instance, among Greeks and Romans their presence on the streets had an apotropaic function) as far as the present author is aware this is the only example in which three phalli are arranged to form such a peculiar symbol. Of course, this symbol was considered of extreme importance by the builders of the Acropolis. As in Mycenae, where everybody entering from the Lion's gate would have to pass under the Lion's relief, also here everybody entering the Acropolis from the northern side would have seen the symbol sculpted by the builders. Taking into account the alignment of the building to the Southern Cross, one is thus led to speculate that the two things might be connected.



Remarkably enough, the abovementioned alignments to the Southern Cross of Alatri and Circei are valid in a period which coincides roughly with the time in which the precessional drift brought under the horizon both Rigil Kent, the brightest star of Centaurus, and the lower star of Crux, *Acrux* (of course, as any other precession-dependent phenomenon, also this one is extremely slow and one cannot identify a "date" at which it occurred, but only a reasonable period). As a consequence, Crux was composed by three bright stars, to which the side with the three niches of the Alatri Acropolis was oriented. Now, an important point is that, if the above described link between Alatri and Circei and the Southern Cross does not occur by chance, then the builders of these constructions add to a widespread tradition of astronomical observations of the Crux-Centaurus asterism in the Mediterranean area. This tradition is *not* documented among the Romans (as far as the present author is aware, the unique possible citation of these stars in the work of a Roman writer is an unidentified "Throne of Caesar" constellation, which might be the Southern Cross, cited by Pliny the Elder in *Nat. His.* II, 78) and therefore our results here point to deny the attribution to the Romans of these structures, together with a shift of a few centuries back in time – especially for Alatri – of the date of their construction from early republican years (V-III century

b.C.) to full Iron Age (VIII-V century b.C.). Regarding the origin of this astronomical tradition, it should be noticed that astronomical alignments to Crux-Centaurus are very well documented in the Mediterranean area from the Bronze Age to the VI century b.C., for instance in Sardinia (Zedda and Belmonte 2004) and in the Balearic Islands (Hoskin 2001, and references therein). In particular, in the Island of Menorca, several "T" shaped megalithic monuments called *Taulas* were constructed, and oriented to the southern part of the sky, in the course of about one millennium starting around 1500 b.C. Perhaps these huge monuments were connected to a cult of the bull, and were therefore meant as stylised images of a bull's head, as archaeologist Mascaro Pasarius (1982) has proposed, but it may well be that they were images, or at least *also* images, of the constellation to which they were oriented, namely, the Southern Cross.

The results of the present paper would certainly be strengthened by independent confirmations coming from the study of other sites in the area; in this respect I would like to point out that, recently, we started a full survey of the imposing megalithic building which lies on the so-called S. Erasmo hill (near Cesi, in the Terni province) and preliminary results from this site do actually show similar alignments.

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