

The “Campanari”: Big Artificially Pierced and Astronomically Oriented Rocks in the South Territory of Monte Iato (Sicily)

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Abstract In Western Sicily, in the province of Palermo, within the municipal borders of the towns of San Cipirello and Monreale, there are two large rocks with artificial holes, bot locally named “Campanaru” (i.e. “Bell Tower”) at less than 8 km away from each other. One of these rocks is still existing and visible from far away. A lightning destroyed the second one in 1968 or a few years later. Both holes are undoubtedly artificial and astronomically oriented with extreme accuracy. The rock still existing on Monte Arcivocalotto has its hole aligned with the sunrise of the winter solstice, while the collapsed one, documented by a photo, by oral testimonies and existing remains, is sited on the Cozzo Perciata hill and had its hole axis exactly oriented at the sunrise of the summer solstice. For the latter perforated rock still exists the tradition that put in relation the sunrise into the hole at the summer solstice with the start of harvesting works which traditionally begin on a date close to the end of June. An Eneolithic/Early Bronze Age settlement is archaeologically well attested at the Monte Arcivocalotto site. Both from Cozzo Perciata and from Monte Arcivocalotto, Pizzo Pietralunga is clearly visible. This is an outstanding, insulated geological structure, on whose base is an Eneolithic/Early Bronze Age settlement, whose materials would indicate a cultic character attendance and/or an exchange site of the local populations. Also in close proximity of the Cozzo Perciata perforated rock are abundant fragments of pottery dating back to the Eneolithic and the Early Bronze Age, while a pseudo-tholos tomb with dromos was found at a few hundred meters. The fact that in this area there are two coeval and similar monuments (artificially perforated rocks) with different and complementary (winter and summer) solstice alignments seems to indicate that here, between the Eneolithic and the Early Bronze Age, a civilization has developed that had a solar calendar and developed a simple but very effective technology to

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materialize it. Other megalithic monuments, dating to the same period and showing astonishing hierophanies at the solstices sunrise, as the so-called “King’s Pulpit” in the nearby park of the “Ficuzza Forest” and others, were found in the same geographic area.

1 Introduction

The *Rollo* of the Archbishopal Church of Monreale¹ is a document drawn in 1182, showing the boundaries and the description of the lands of the immense area of western Sicily assigned in feud and church dioceses to the Monreale archbishopric by William II. In particular, in the description of the territory identified as *divisa terrarum hospitalis Sancte Agnes*,² the existence of a *petra perforata*, part of a group of four *petras plantatas ordinatim posita*, is remembered. This is not the only case of special stones mentioned as reference points.³

Isolated stones, sometimes artificially stuck in the ground, and possibly artificial alignments of stones are then registered in the territory of Monreale in the twelfth century: in particular, the presence of a perforated stone caught the attention of the drafters of that famous document. Obviously stones *plantate* (=stuck) in some cases could also be natural, or they could be been stuck in the ground even in very recent times, as a signal for border demarcation. However, in most cases they had to be stones of a certain size, well visible and conspicuous in the territory. Every other consideration concerning the *petra perforata* in the *divisa terrarum hospitalis Sancte Agnes* would be arbitrary. We must thus limit ourselves to register the fact that at least a perforated stone appeared visible in this territory, in AD 1182.

However, a big rock with large artificial circular hole is still visible on Mount Arcivocalotto⁴ (37° 55′ 10.34″ N–13° 14′ 15.46″ E), a few km from the southern slopes of Monte Jato, in Monreale municipal area, about 30 km south Palermo (Fig. 1). The site is not far from the medieval *divisa hospitalis Sancte Agnes* remembered in 1182, if the most accepted identification of the latter with the Sant’Agata district in the municipality of Piana degli Albanesi is correct.

¹A digital version of the *Rollo* manuscript is present on the web at: <http://vatlat3880.altervista.org>.

²The term *divisa* identify a territory. The *divisa* of Hospital of St. Agnes is usually identified with the present day “contrada S. Agata” (IGM F° 258 I N.O. Piana degli Albanesi).

³In the *divisa Haiarzeneti*, not far from the *hospitalis Sancte Agnes*, the same document cites the presence of a *petram magnam plantatam*. Other *petras plantatas* are cited in the *magna divisa Iati*, the lands dependent on the fortified hill center of Iato (in arabic, *qal’a*). *Petre magne plantate insimul* in the *divisa Hendulcini*, and *petre plantate* in the *divisa* of *casale Benbark* and in other ones were also cited in the *Rollo*.

⁴The current name is easily connected to the ancient Arab names *HagiARBukal* today Arcivocale district, and *Rahalbukal*, mentioned in the *Rollo*, near which stands Monte Arcivocalotto, actually a mere 569 m high hill. The Arcivocale town name comes from the Arabic *al-Hagar būqāl*, “Stone Mug” (Caracausi 1994, p. 68).



Fig. 1 The “Campanaru” of Monte Arcivocalotto

2 The “Campanaru” of Monte Arcivocalotto

This remarkable monument has been repeatedly published (e.g. Polcaro et al. 2012; Scuderi et al. 2013, 2015) and will therefore only briefly described. It is situated in the area of Sicani Mountains in Northwestern Sicily, in the part in which the Jato river flows into the Belice river in its northern branch, forming a line of communication between the interior and the southern coast of Sicily. The area, inhabited at least since Neolithic times, had a great development in the Bronze Age.

The site at the foot of Pizzo Pietralunga (Fig. 2), an isolated natural rock about 150 m high, which stands on the Belice Valley (Scuderi et al. 1997), is of particular importance.

In the Middle Ages this enormous isolated rock probably was an easy and immediate reference to the indication of the boundaries of the surrounding lands, all belonging to the Church of Monreale⁵ (Nania 1995, p. 107). Considering the size, position and the certainly out of the ordinary profile of Pizzo Pietralunga and its visibility from long distance, it is easy to conclude that this extraordinary rock has most probably attracted the attention of the prehistoric inhabitants of the area.

At its feet it is in fact sited a wide archaeological area (4500 m²) with Eneolithic Age and the Bronze Age materials (e.g. Scuderi et al. 1996, p. 21). The settlement

⁵In the famous *Rollo* of the Monreale Church the present *Petralonga* (Sicilian name for Pietralunga) is probably recorded as *Hagiabukal* (see note 4).



Fig. 2 Pizzo Pietralunga

of Pizzo Pietralunga, would seem to have the site of Monte Arcivocalotto as hegemonic center, while the fineness and the particularity of the materials present at the feet of Pizzo Pietralunga, including ceramic of the Bell Beaker Culture very rare in this area, could indicate a particular role and function (religious and/or exchange area) acting within the district.

Not far away, the Monte Arcivocalotto site is placed in a dominant position, on the isolated hill at about 500 m above sea level. This hill is located at almost equal distance between the mountains of Rocca Busambra and Monte Jato and about 2.5 km from Pizzo Pietralunga. This settlement is known since some time, thanks to the surface presence of fragments dating from Eneolithic to the Bronze Age. The site was later occupied in the Roman, Byzantine and Medieval period (Scuderi et al. [2011](#)).

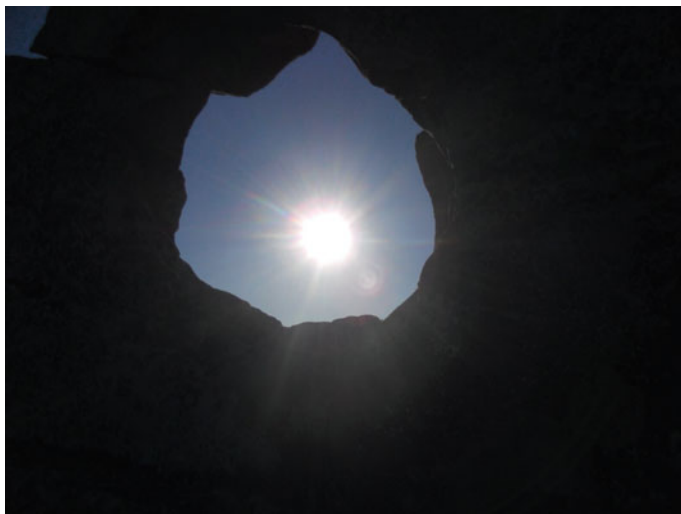


Fig. 3 Dawn of the winter solstice at the Campanaru of Monte Arcivocalotto

The imposing megalith on the side of Monte Arcivocalotto, just below the top of the hill, is visible even from a large distance. It is called in local dialect “u Campanaro” (“The Bell tower”). It is a large slab of arenite, about 4 m long and 3 m high. Its cross section is roughly triangular, with a thickness of about 1.5 m at the base; the western side is almost vertical, while the eastern one is inclined by about 75° with respect to the horizontal plane. At its center a circular, clearly artificial, hole is dug, with a diameter of about 2 m. In the internal thickness of the hole, a concave seat has been formed, of about 20 cm in height. A narrow step, about 50 cm wide, follows the northwestern side of the megalith, almost on the edge of the steep cliff of about 20 m in height over the small plateau, where the Bronze Age settlement was sited. On this step, just below the hole of the megalith, a petroglyph in concentric squares is carved.

Measurements made by a precision optical bearing compass⁶ showed that the axis of the central hole has an azimuth of $133^\circ \pm 1^\circ$ and a height from the horizontal plane of $15^\circ \pm 1^\circ$; this axis is clearly identifiable, even at a considerable distance, by an inverted V shaped notch in the upper edge of the hole. Because of this orientation, the sun rises over the geographic horizon at the center of the hole, exactly at the winter solstice (Fig. 3).

The megalith shows therefore a manifest astronomical orientation and there is clear archaeological evidence of intentionality: the hole and the inverted V notch, indicating the axis, are in fact clearly intentional. In addition, the megalith shows clear signs of works performed to point the axis of the hole in the selected direction.

⁶Measurements were corrected for local magnetic declination by detecting coordinates with GPS and comparison with the IGM cartography and geo-referenced satellite images.

Furthermore, the concentric squares petroglyph, engraved on the step at the foot of the megalith on its NW side, is aligned exactly as the axis of the hole: the petroglyph too is thus oriented towards the dawn of the winter solstice. On this day, and only on this day, the first rays of the rising sun illuminate the square engraved on the rock, because of two small notches carved into the bottom edge of the hole. Therefore, the petroglyph allows those who are on the step to recognize with great accuracy the exact day of the winter solstice.

With regard to the ethnological evidence, testimonies of the modern folklore show that the megalith was considered, until recently, a sacred and magical place, as is evidenced by the legend that justifies the megalith name of “Campanaru”, identifying him as the bell tower of a destroyed church, which plays alone on special days. This legend then assigns the megalith mystical and calendrical role.

It remains to assess the statistical significance of this alignment. The probability of a single solar alignment in azimuth is equal to $1/22$, corresponding, in Gaussian statistics, to 2.08σ (Schaefer 2006). However, in the case of the megalith of Monte Arcivocalotto, we must consider that the phenomenon occurs only because the rising sun, as it passes to the azimuth of the hole center, also has a height over the astronomical horizon equal to the one of the geographical horizon, blocked for 15 degrees by the Rocca Busambra mountain: it can be calculated that the probability of this independent event is equal to $1/45$ (Curti et al. 2009), corresponding, in Gaussian statistics, to about 2.5σ . The alignment in azimuth and height with a significant solar position then has a conditional probability of random coincidence of 3.25σ . In addition, the petroglyph axis azimuth alignment with the dawn of the winter solstice has an additional probability equal to 2.8σ . The conditional probability of the simultaneous presence of these events is therefore equal to 3.56σ and is thus higher than the internationally accepted threshold of 3σ . We can therefore reasonably claim that the “Campanaru” satisfy all the conditions of the “Schaefer (2006) test” to be considered a megalith intentionally oriented in an astronomical direction.

3 The Relationship Between the “Campanaru” and Pizzo Pietralunga

It should also be considered that even the Pizzo Pietralunga site has other alignments with the dawn of the winter solstice.

Indeed, on this day, at the same time in which the rising Sun appears in the hole of the megalith, it is seen shining right behind Pizzo Pietralunga, when viewed from the right position. Of course, this is a purely natural event and therefore of no statistical value. However, at the same time, the rising Sun appears, from the same location, at the center of the image of Campanaru reflected in the river at the foot of Pizzo Pietralunga. Since the position on the hill slope of the megalith is not a natural fact, even for this event, clearly independent from those relating to the

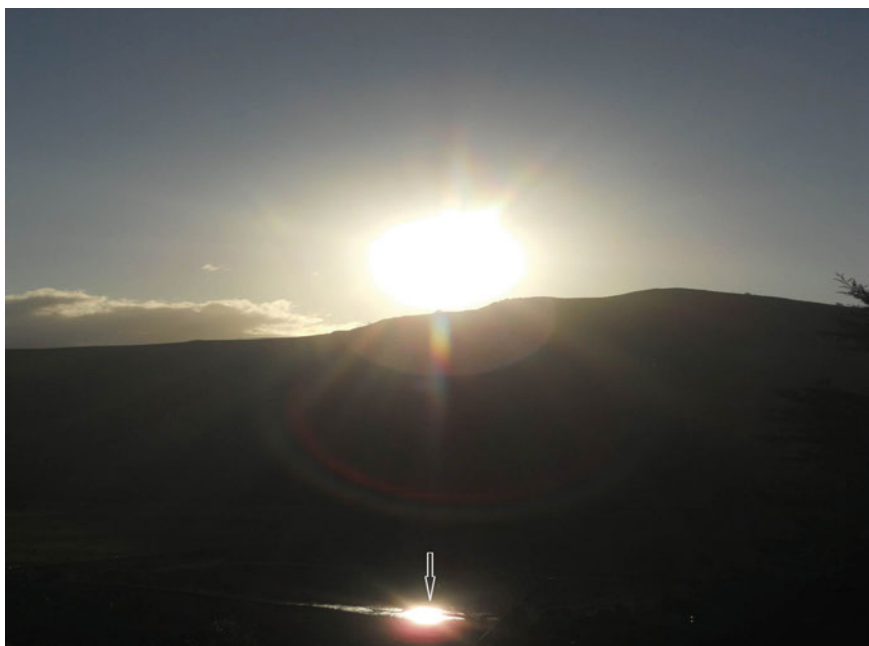


Fig. 4 The rising sun at dawn of winter solstice is seen from Pizzo Pietralunga reflecting on the Belice river

megalith geometry, must be assigned a 3.25σ probability of being random, involving an alignment in azimuth and height with the rising sun over the geographic horizon at the dawn winter solstice (Fig. 4).

In addition, a group of four artificial hole are presents in the Pizzo Pietralunga nearly vertical slope facing to South East. They were clearly made to house posts, which supported an unknown structure, probably a panel of some perishable material. These holes are aligned in such a way that at the dawn of the winter solstice, the sun shines directly on their bottoms. This means that at that time, and only at that moment, the shadow of the structure supported by posts was projected onto the rock surface exactly on the rectangle identified by the poles, giving a visible signal to the date of the solstice. Also to this event, independent of the previous ones, must be attributed a probability of randomness of 3.25σ , as it also implies the coincidence azimuth and altitude of the holes axis with those of the rising Sun at the dawn of winter solstice.

On the other hand, it can be shown that the Campanaru and Pizzo Pietralunga are connected. In fact, an engraved stone was found near the megalith of Monte Arcivocalotto in 2012 (Fig. 5). On it, many symbols are engraved, the study of which is in progress. However, it is clear that the phallic symbol represented on the left repeats exactly the Pizzo Pietralunga profile. In addition, near the megalith, a worked monolith was found. It was felled, but intact and still in the original

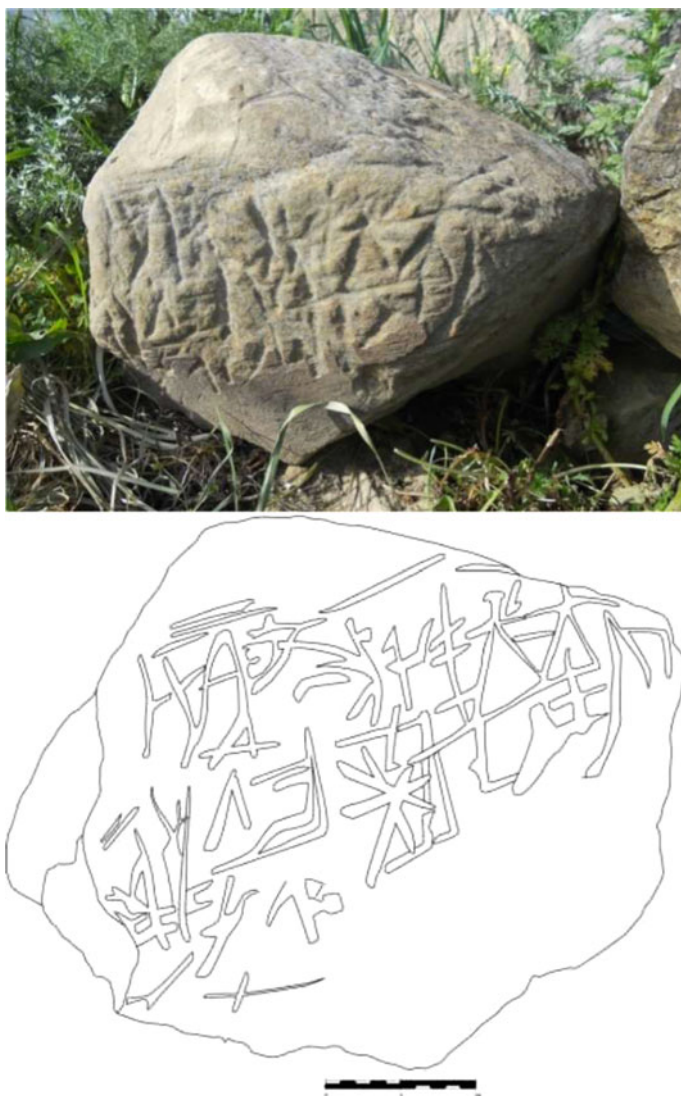


Fig. 5 The engraved rock found near the Monte Arcivocalotto megalith

location, exactly on the axis of Campanaru: working has made that this monolith has taken exactly the profile of Pizzo Pietralunga (Fig. 6).

In conclusion, these findings, along with clear archaeological evidence of contemporary attendance of the Monte Arcivocalotto and Pizzo Pietralunga sites by the same culture allow to claim that they are connected to each other. Therefore, the probability that the described simultaneous azimuth and height alignments to the dawn of the winter solstice are only occurring by chance is summarized in Table 1.



Fig. 6 The worked rock repeating the shape of Pizzo Pietralunga, straightened in its original position

Table 1 Probability of random coincidence of alignments with the dawn of the winter solstice in the Monte Arcivocalotto—Pizzo Pietralunga complex

Alignment to the dawn of winter solstice	Statistical significance respect to the null hypothesis (random alignment)— σ
Axis of the central hole and of the petroglyph in the <i>Campanaru</i> of Monte Arcivocalotto	3.56
Holes in the Pizzo Pietralunga slope	3.25
Sun rising in the reflected image of the <i>Campanaru</i> in the river at the base of Pizzo Pietralunga	3.25
Total compound probability	5.81

We recall that a Gaussian statistical significance of 5.81 σ corresponds to about one chance in a billion of chance coincidence. Given also the archaeological and ethnological evidence, we can thus reasonably claim to be in the presence of a megalithic complex intentionally oriented in an astronomical direction.

Other discoveries (Scuderi et al. 2013) reinforce this hypothesis. First, a few hundred meters from Pizzo Pietralunga a complex altar excavated in an isolated rock outcrop was discovered. The artifact is characterized by a stone staircase carved into the rock and fairly well preserved, which leads to the top of the boulder.

There, at various heights, basins collecting rainwater were dug: two of them are in communication by a hole, perhaps astronomically oriented. The study of this artifact is still ongoing, but its very presence confirms the importance of the Pizzo Pietralunga cult site. Furthermore, under the megalith of Monte Arcivocalotto, at the foot of the cliff that is located on its NW side, a tomb was discovered containing Early Bronze Age pottery fragments, including the ones of the “Bell Beaker Culture”. Last, a group of four stones, probably artificially positioned, was discovered on top of Pizzo Pietralunga, by an ortho-photo taken from a kite. Their meaning is still under study.

4 The Cozzo Perciata Megalith

However, the most important discovery is certainly that of a second perforated rock (Scuderi et al. 2015). It is located about 6 km from Pizzo Pietralunga and 8 km from Monte Arcivocalotto, on top of a hill, significantly called Cozzo Perciata (“The hill of the drilled one”), a name that clearly refers to the existence of a perforated rock.

It has collapsed in recent times, it is said because a lightning, but many witnesses say that it was extremely similar to Monte Arcivocalotto “Campanaru”, as evidenced by a photograph taken at the end of the '60s, or early '70s. This photographic image, by direct testimony of the author was attached to a file concerning the damage due to a drought episode. The photo depicts the Cozzo Perciata and the second perforated rock is very clearly and unequivocally visible on its top (Fig. 7). There is no reason not to believe original and certainly relative to Cozzo Perciata the photo, whose image is quite comparable to the present day profile of the Cozzo Perciata and shows, in the lower right angle of the photo, a stone water trough still existing at the southern foot of the Cozzo Perciata (Fig. 8).

Concerning the perforated rock, the lower part of the hole is still perfectly preserved, and this allows to easily measure the axis, with the same technique used for the megalith of Monte Arcivocalotto.

From the hole of the rock, the summit of Pizzo Pietralunga is viewed with an azimuth of 60.6° and a height of $1.7^\circ (\pm 1^\circ)$: this direction corresponds to the dawn of the summer solstice over the geographic horizon in 2000 BC. Looking through the remains of the hole of the megalith of Cozzo Perciata at the dawn of the summer solstice, still today it is possible to see the rising Sun that touches the top of Pizzo Pietralunga. Then, from the bottom of the valley, everyone can see the Sun rising within what remains of the megalith (Fig. 9).

Important ethnographic testimonies of sacred and calendar value are reported even for this rock: it too was called in Sicilian ‘*u Campanaru*’ or even ‘*a petra unni nasci u suli*’ (“The stone where the Sun rises”). The same witnesses who have indicated these names state that, until a few decades ago, the rise of the Sun in the hole of this rock was the signal of the beginning of the period for harvest.

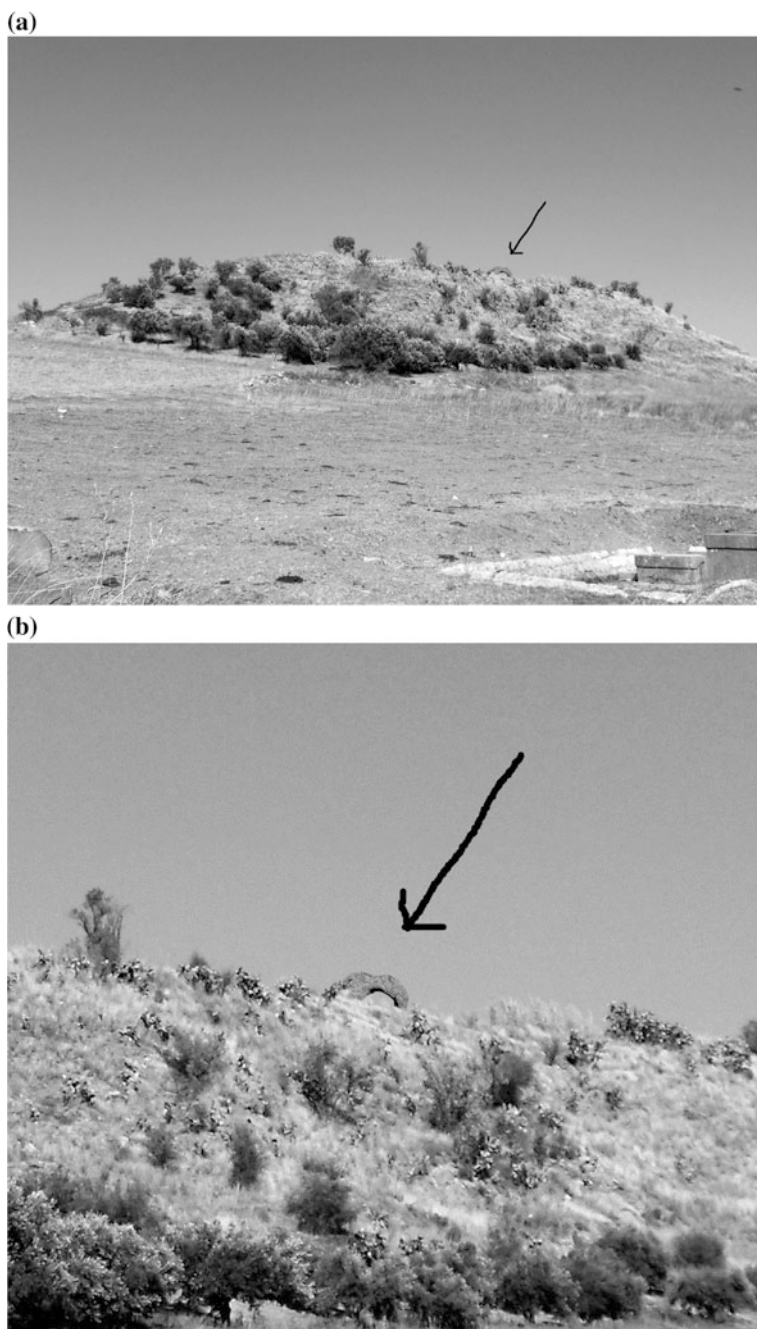


Fig. 7 The old picture showing the Cozzo Perciata megalith: **a** original picture; **b** detail of the megalith



Fig. 8 A present day picture of Cozzo Perciata. The *upper* arrow shows the perforated rock; the *lower one* the water trough

As for archaeological evidence in the Cozzo Perciata area, already in 1997 some ceramic fragments were published (Scuderi et al. 1997, pp. 333–340), of certain attribution to Eneolithic and Early Bronze Age, in particular to the San Cono-Piano Notaro and Rodì-Tindari-Vallelunga facies (Fig. 10).

More recent surveys, carried out both on the ridge and on the plateau to the Southeast, have led to the discovery of flint and obsidian blades (Fig. 11) and pottery fragments dating from the Late Neolithic to the Bronze Age and occasional fragments attributable to the Iron Age. The dispersion area of the fragments is about 5,000 m², although a large part of the archaeological area suffered utilization of agricultural type in other historical periods.

It is worth to remind a fragment of the Bell Beaker Culture (Fig. 12), and an innumerable amount of fragments belonging to the pre-Castellucciana and Castellucciana cultures. The same typology of ceramic fragments were found in a tomb discovered under the pierced rock: the Monte Arcivocalotto, Pizzo Pietralunga and Cozzo Perciata sites are, to date, the only area in which there is the presence of ceramics attributable to the Bell Beaker Culture that, in other European regions, is indisputably linked to Megalithism. The analogy between the megaliths of Monte Arcivocalotto and Cozzo Perciata is therefore very strong.

Recently, less than 1 km from Cozzo Perciata, a roughly hemispherical shaped artificial cavity (about 5 m diameter × 3.50 height) with a circular summit hole,

Fig. 9 Sunrise at the summer solstice at Cozzo Perciata: **a** the firsts rays of the rising Sun touch the top of Pizzo Pietarlunga (shown by the *white arrow*); **b** the rising Sun shine at the centre of the remains of the hole; **c** the Sun rises at the position of the perforated rock



Fig. 10 Eneolithic and Early Bronze Age ceramic fragments (San Cono-Piano Notaro and Rodi-Tindari-Vallelunga facies) found in Cozzo Perciata





Fig. 11 Flint and obsidian blades found in Cozzo Perciata



Fig. 12 Fragment of Bell Beaker Culture ceramics found in Cozzo Perciata

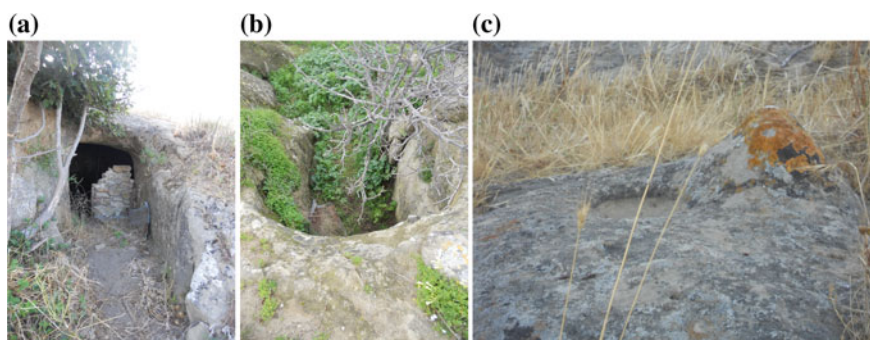


Fig. 13 **a** The entrance of the tholos tomb; **b** the access corridor of the tomb; **c** the pinnacle and the cup-mark above the tomb

now mostly artificially walled, has been discovered. The cavity is reached through an open-air corridor also cut into the rock and a room-door roughly rectangular. Outside, above the cavity, a pinnacle and a cup-mark carved into the rock are present (Fig. 13).

The typology, and in particular the presence of the dromos carved into the rock, leads immediately and with little doubt to the Thapsos tombs with dromos and, in closer geographical context, to the tholoid tombs of Sant' Angelo Muxaro and of the area of Platani (Tommasello 1997).

Ultimately, the fact that, in this area we found two coeval and similar monuments (rocks artificially perforated) with solstice alignments in azimuth and height

different and complementary (winter and summer solstices) shows that here, between the Eneolithic and the early Bronze Age, a culture has developed that had a solar calendar and developed a simple, but very effective, technology to materialize it.

5 The “King’s Pulpit”

Another monument gives us further guidance on what might have been this culture. The rocky artifact, known locally as “Pulpito del Re” (“The King’s Pulpit”⁷), is located in the province of Palermo (geographical coordinates 37° 52′ 53″ N, 13° 24′ 00″ E, 864 m height above sea level), inside the natural park of the “Bosco della Ficuzza”, not far from the megalithic complex centered on Pizzo Pietralunga (Scuderi et al. 2014). The geographical area, in which this artifact is situated, has been little studied so far from the archaeological point of view, although it is located in a territory whose attendance is documented from Eneolithic to all the Early Bronze Age.

In particular, not far from the pulpit, our group has discovered a settlement dated, by the large number of ceramic fragments on this site, to the Castellucciano (a culture of the initial phase of the Early Bronze Age, especially widespread in the South-East Sicily and temporally placed between 2200 and 1400 BC). Near this settlement, on the path leading to the pulpit, we found a flat rock, more or less oriented towards North-South, where the image of a bull is engraved. A basin carved on it and many cup-marks on the bull body suggest a sacred role of this rock (Fig. 14).

The King’s Pulpit is made from a natural outcrop of siliceous rock, with an approximately circular base (Fig. 15). A staircase carved on this rock leads to a semicircular clearly artificial platform, which represents a kind of “podium”, with a flat base, surrounded by seats with backrest, also carved in the same rock. The staircase consists of 12 steps, is 6.4 m long and has a width of 0.75 m. It is inclined

⁷The popular name, reported only in the Twentieth Century maps, is explained locally by the legend that it was built as a hunting station for King Ferdinand IV of Bourbon (1759–1825), whose luxurious summer residence was actually built a few kilometers away, at the beginning of the Nineteenth Century. However, this explanation has no foundation, because the artifact is shown on a map of the early Eighteenth Century, thus more than half a century before King Ferdinand IV, as “a rock engraved with a staircase”. Moreover, the upper part of the artifact is clearly visible from all sides and is therefore unsuitable as a hiding place for hunting. However, ethnographic studies have not been done on this name and its origin, so we do not know how much it is ancient: we can not exclude that it was named so since a long time and was later associated with Ferdinand IV. Indeed, at about 200 m from the pulpit, there is another rock modified by man, similarly shaped in some respects, but definitely of much more recent work, as suggested by the lack of erosion processes. Even in this case, a staircase has been excavated on the rock, leading to an upper base, where the Bourbon crest is graved. Furthermore, this other rock is placed in an elevated position, but sheltered from view, which seems much more suitable, than that of the “King’s pulpit”, as “hunting station”. It is thus reasonable to assume, that this is the true pulpit of King Ferdinand IV, and that, with the passage of time, a confusion between the two artifacts occurred.



Fig. 14 The bull engraved in the rock



Fig. 15 The Pulpit of the King top “podium”

by 22° and presents a kind of groove, which may be due to repeated dragging of a heavy load. In addition, all the rock shows a series of basins, niches, cup-marks, reticular carvings and perforations of obvious artificial origin. Many ceramic fragments of the Early Bronze Age were recovered near the pulpit: this fact and the same structure of this artifact allow to identify it as a Castellucciano altar, in many respects similar to those of Rocca Pizzicata and Pizzo Pietralunga.

A rocky protuberance has been left at the center of the podium and a clearly artificial hole was carved in front of it, in the semicircle of the rear part of the seats



Fig. 16 The Pulpit and the second rocky spur

(Fig. 16). This approximately conical bore, of irregular shape, pass through all the rock up to its exterior, where the longest side is of about 30 cm and the maximum height is of about 10 cm. Over the hole, a V-shaped incision is carved into the rock: this incision, the hole and the tip of the protuberance on the platform lie in the same vertical plane.

In a second rock outcrop, 10.5 m from the pulpit, another notch in the shape of V is artificially carved. This incision, the tip of the protuberance and the hole in the back of the pulpit seats are aligned on the same axis.

The Pulpit orientation measurements were carried out by us on 20th December 2013 and 9th May 2014, using a precision bearing compass (Optical compass DQL-6 model). The magnetic declination was determined by measuring the position of the Sun with the same instrument (with the objective shielded by a $H\alpha$ filter) compared with astronomical ephemeris. It was found equal to $2.5^\circ \pm 0.2^\circ$ E, a value in good agreement with the NOAA model, which gives, for the geographical coordinates of the site (measured with a GPS Magellan eXplorist GC model, with an instrumental uncertainty translated into linear units of ± 20 m) and the measurement date (May 9th 2014) a value of 2.53° E.

These measurements have shown that the orientation of the staircase (geographical azimuth = $180.5^\circ \pm 0.5^\circ$) perfectly corresponds to the local meridian.

The sight line connecting the hole, the tip of the central protuberance on the podium and the V-shaped incision on the second rocky spur placed in front of the Pulpit is more difficult to measure, given that the irregular shape of the hole makes it difficult to identify a precise point of observation and the protuberance is too low to allow the positioning of the optical compass. For this reason, this line of sight was measured in the opposite direction, i.e. from the incision in the second rock to

the tip of the protuberance and the hole. It has been found that this axis has a geographic azimuth of $60^\circ \pm 0.5^\circ$ and a height, with respect to the horizontal plane of $-4.4^\circ \pm 0.5^\circ$. The astronomical declination of the opposite viewing direction therefore corresponds to $22.8^\circ \pm 9.9^\circ$, being the uncertainty due to the error propagation of the azimuth and elevation uncertainties in the declination formula. The central value of the declination, however, coincides almost exactly with that of



Fig. 17 The hierophany of the summer solstice dawn at the King's Pulpit



Fig. 18 The pinnacle of the third rock is illuminated by the Sun rays passing through the hole in the Pulpit

the sun at the summer solstice: it was thus decided to observe the possible effects of light on the structure at the dawn of this date.

One of us (AS) was therefore present at the pulpit at sunrise on June 21st, 2014. It was observed that the Sun actually rises inside the hole, it shines in its center after a few minutes and then appears in the V-shaped incision in the back seat over the hole (Fig. 17). At this time, the Sun rays illuminate a rocky artifact on the back of the pulpit, where a copy of the protuberance on the podium is carved (Fig. 18). The probability that such a hierophany happens by chance is very low. In fact, considering that each alignment in azimuth and elevation with one of the 8 significant solar positions has statistical significance of 3.3σ compared to the null hypothesis and that there are in this artifact 4 of these alignments⁸ (Fig. 19) plus a coincidence azimuth (scale of the Pulpit—meridian) which involves other 2.08σ of significance, the resulting composed statistical significance is 6.9σ .

The Castellucciano altar known as the King's Pulpit shows thus clearly that the astronomical alignments were deliberately sought in this artifact. The amazing hierophany happening at sunrise on the summer solstice seems to be designed for a complex ceremony to be performed on that day.

⁸Hole—viewfinder in the second the rock, hole—pinnacle on the Pulpit podium, pinnacle on the Pulpit podium—viewfinder in the second rock, viewfinder on the seats of the Pulpit—pinnacle in the second artifact.

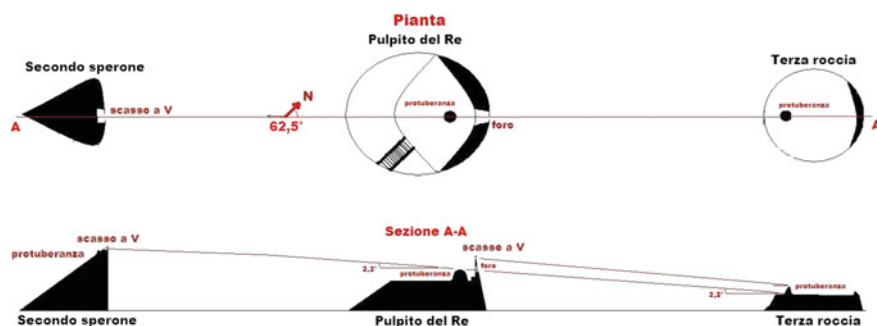


Fig. 19 Schematic plant and section of the King's Pulpit complex

6 Conclusions

In conclusion, sufficient objective data support the hypothesis that South of Monte Jato we are faced with significant archaeological discoveries with obvious astronomical implications. The two perforated rocks, located at a distance of less than 8 km from each other, respectively indicate the dawn of the winter solstice and the summer solstice, with all the cultural, agricultural and worship implications that can be consequently hypothesized. The intentionality and the connection of the two monuments can hardly be questioned. Hypothetically one can imagine that, to achieve this technological result, careful and long, perhaps even years, research has been accomplished of two rocks in the same area having the characteristics and the desired orientation, before proceeding with appropriate skills to their processing to obtain the desired effect.

It would appear superfluous to recall here, following Eliade (1955, Chap. VI), the importance of the role that the artificial or natural “pierced stone” play in anthropology and ethnography. The same popular memory of the Palermo “Emperor stone”, whose shadow, in the time of Frederick II, would indicate the end of the working day for agricultural laborers, constitutes testimony, though faded, of an ancient use of alignments of natural or artificial stones and rocks and the shadow they cast, to mark time.

Reasoning on the age in which the two large holes were opened in the respective rocks, with particular purposes related to the solar position at the time of the solstice sunrises, is obviously not easy. However, we believe that one can assume with good reason the existence in prehistoric times of a large area, an “archaic landscape” with a great sacred value in the territory South of Monte Jato.

The extraordinary hierophany of the summer solstice, made following similar principles (perforations in natural rocks) but with far greater sophistication, at the Castellucciano altar named “Pulpit of the King” makes us lean towards the hypothesis that the Castellucciana culture is also the author of “stone calendars” of Monte Arcivocalotto and Cozzo Perciata. The astronomical orientation of other artifacts of the same culture therefore deserve further studies.

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