

BOOK OF ABSTRACT

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On A new hypothesis on the etymology of the name Antares

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keywords: Scorpio, Orion, etymology, phonetic transformations, mythology

ABSTRACT

The weak motivation, weak at least from a logical point of view, always considered at the origin of the etymology of the word Antares, may suggest that the name dedicated to the alpha star of the Scorpio constellation derives rather from something else. Usually it is presumed that the reason for the existence of that name lies in the fact that the name seems to have been obtained from the simple combination of the preposition anti-, indicating something that opposes someone/something (or similar to someone/something), and Ares: Greek name both for the bloodthirsty deity - to clarify, the Mars of the Romans - and for the red planet connected to it. This misleading assonance, in our opinion, between the name Antares and those two parts presumed to compose it, has prompted me to seek an alternative motivation for its origin, which I believe should be sought not only in the physical opposition (they really are on opposite sides of the sky) and narrative between Scorpio and Orion as told by myth, but also from the similarity between that red star and the other, Betelgeuse, of the same color, present in the constellation of Orion. In this case, the name Antares could be the result of the combination of that same preposition anti- and the name of the "great hunter"; a combination that could then have undergone the various phonetic changes highlighted by this study over time. This hypothesis, if valid, would this time be based not only on astronomical reasons, but also on other factors borrowed from different fields such as mythology, linguistics, anthropology, history and, in my opinion, much more solid than those proposed instead by tradition and always supremely assumed to be valid.

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The Pietre dell'Incalvicata Megaliths (Calabria, Italy): A Solstitial Marker?

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keywords: Monoliths, Skyscape, Solstice, Elephant, Prehistory, South of Italy

ABSTRACT

The megaliths of Pietre dell'Incalvicata, located at 730 m a.s.l. in the Sila Grande mountains (Campania, CS, Calabria) are made of two sandstone monoliths about 5 meters high, standing out from the natural bedrock and carved by both natural and, probably, human action. The first monolith resembles an elephant, just like the fossilised exemplar of *Elephas Antiquus* found in the lake Cecita nearby. The second monolith, much more eroded, was assimilated to the legs of a colossus. Well known by the locals and brought to public attention about 20 years ago by Domenico Canino (2007), their purpose remains unknown. After an intuition by Nilo Domanico, this study proposes to investigate their topographical arrangement in relation to the sun's turning points on the local horizon. This can be precisely done since, on a hill half-kilometre away, a third hollow monolith is located, marking the solstitial direction with great accuracy. A first test was made on winter solstice looking from the back of "the elephant" and "the colossus' legs" towards the hill of "the hollow monolith" in the direction of the sun rising. A second test will be performed on the summer solstice: from that same hill, the sun may be seen setting in the middle of the two main monoliths. Historical sources recount the presence of an arch on the site, so that it is possible the two monoliths were joined on the top, and the sun might have been framed within it on its northern setting position. Combining these skyscape observations with topographical UAV surveying, geological analysis, archaeological comparisons, and historical records, it may be possible to give a new interpretation of the site. Yet, some problems arose from the lack of any archaeological excavations which prevents any chronological assessments and "the hollow monolith's" fall on the ground. Nevertheless, there are hints to suggest that the site of Pietre dell'Incalvicata is a site of skyscape interest and a prehistoric solstitial marker.

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On the orientation of the sacred buildings on the hill of the Valley of the temples in Agrigento. New considerations and a dating proposal.

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ABSTRACT

This contribution summarizes the studies previously conducted on the orientation of the temples of the ancient Greek colony of Akragas, whose dating is between the end of the 6th and the second half of the 5th century BC. Considering that the 'topographic' or 'stellar' motivations reached by scholars who have previously addressed the question is not exhaustive. Observing the topographic conditions on which the sacred buildings were placed, was the starting point for our research: those who were involved in the design of the temples of Akragas could have easily overcome the minimal orographic difficulties that encountered since we are talking about just a few centimeters to achieve a precise East West direction. The orientation, therefore, while taking into account the city layout, must have been dictated by an 'other' reason that we sought in the astronomical dynamics linked to the fundamental moments in the life of a Greek man starting from the assumption that his every action it was linked to Sky, to the seat of the divinities and the construction site of each construction was certainly linked to rites in which the astronomical element had fundamental value.

Our proposal for Akragas consists of specific dates of the solar calendar (vernal equinox) also consistent with the lunar calendar (the first new moon immediately following the spring equinox). From our calculations, dates emerged which agree well with the archaeological dating and emerged very specific 'years' in which we believe the construction of the sacred building could have begun. Interweaving of archaeological data with astronomical data can act as a stimulus and open new horizons of understanding with respect to the knowledge of ancient man and, in this case, push for a rereading of the entire civic, public and sacred construction site of ancient city of Akragas.

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The so-called 'eyes' of Milazzo Castle (Northern Sicily): an Astronomical approach

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keywords: Middle Ages, Sicily, summer solstice, Milazzo, castle

ABSTRACT

The Milazzo Castle (national monument), with a surface area of over 7 hectares, of which 12,070 square meters are covered by buildings, stands out over the Milazzo landscape at the top of the ancient "Borgo" representing one of the largest fortified complexes in Europe. The reasons for its location are based on the extraordinary strategic value of the Milazzo peninsula that extends towards the Aeolian Islands, guarding a natural harbour that has always been one of the most important ports in Sicily.

The castle on the north-west side is protected by the natural overhang, while towards the south-east, the slope towards the city and the port is defended by the progressive alternation of the walls. The mass of the castle, cleverly placed at the top of the promontory, also dominates the isthmus.

The iconographic scheme of the complex is articulated and is formed by: Norman keep with a square plan; block of the domus with a rectangular plan; rectangular 'Swabian' wall enclosing the two buildings just mentioned, with protruding towers with a square plan and with internally juxtaposed factories that have elongated rectangular or trapezoidal plans; polygonal 'Aragonese' wall with semi-cylindrical bastions enclosing the Norman and Swabian complex; further sixteenth-century wall with triangular bastions towards the south-east.

From a spur on the medieval walls that overlook the promontory towards "Tono's Beach", stands out a quirky drawing made with igneous black stonework whose origins have been object of motley speculations. The hypothesis that we want to follow and develop is strictly related to the archaeoastronomical meaning of the exact index of summer solstice, which is an expression of Norman and Swabian mystical and esoteric traditions. The eyes were laid on the spur at the end of the Norman-Swabian walls, and in origin featured bulging pupils without paws, which were added at the end of the XIX century. The paws were included around 1870, since Perdichizzi (1692) only refers to eyes.

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Byurakan Astrophysical Observatory as a Cultural Astronomy Centre

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keywords: IAU Outstanding Astronomical Heritage, UNESCO Heritage, Interdisciplinary Sciences, Scientific (Astro) Tourism, Cultural Astronomy, Scientific Journalism.

ABSTRACT

The Byurakan Astrophysical Observatory (BAO, founded in 1946) is an astronomical cultural heritage (included in the IAU Outstanding Astronomical Heritage (OAH) in 2021) and serving as Armenian National Value since 2013. Since 2015, BAO serves as one of the IAU's Regional Offices of Astronomy for Development (ROAD), for the South West and Central Asian (SWCA) Region. It has a unique national-style architectural ensemble, a nice garden recognized as arboretum and its photographic plate archive is also an astronomical heritage. Moreover, the famous Markarian Spectroscopic Sky Survey 1874 spectroscopic plates having 40 million low-dispersion spectra have been included in UNESCO "Memory of the World" documentary heritage international register in 2011.

BAO and Armenia in general are very active in organization of meetings and schools for young scientists related to astronomical heritage and astronomy in culture: Conference "Astronomical Heritage in the National Culture" in 2012, Symposium "Relation of Astronomy to other Sciences, Culture and Society" (RASCS) in 2014, Young Scientists Conference "Cultural Astronomy in the Armenian Highland" in 2016, UNESCO Regional Conference "Astronomical Heritage of the Middle East" in 2017, International Conference "Astronomy in the Crossroads of Inter- and Multi- Disciplinary Sciences" in 2021, Armenian Astronomical Society 25th anniversary meeting RASCS-2 in 2024, summer schools and Byurakan Science Camps related lectures, etc. BAO's territory and garden have been recognized as arboretum, BAO has Viktor Ambartsumian's house-museum and UNESCO heritage centre. At last but not least, BAO is a Scientific (Astro) Tourism centre recognized by the IAU and Armenian Institute of Tourism; a number of related projects have been accomplished. BAO is the initiator of the Scientific Journalism in Armenia as well. We will give a review on BAO's cultural activities and show how an astronomical/astrophysical observatory can also serve as a cultural centre.

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On the orientations of some 'rocky altars' of the Val Demone (North-East Sicily)

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keywords: Val Demone; Sicilia; rock-cut altars; protohistory; horizons

ABSTRACT

In Val Demone, one of the three ancient valleys into which Sicily was divided in medieval times, there are some so-called 'altars' carved into the rock, monuments that have sparked the imagination of local and non-local scholars (Pantano 1994; Todaro 1992). In particular, there are numerous speculations on the 'gnomonic' value of these places, sites for which, among other things, there is little certain information (and in some cases none) on the construction chronology and their real history. Rocky palmenti are also often mistakenly considered 'altars', but palmenti are monuments generally made up of 2 basins which have been used since ancient times to produce wine (e.g. Olcese et Al. 2020).

This contribution will deal with 3 rocky 'altars' that are in the following sites (all located in the province of Messina): the Vignarazza district in San Cono (Tripi), the Rustica district (Roccella Valdemone) (Orlando et al. 2016) and the Argimusco district (Montalbano Elicona) (Orlando 2017). For each of the altars considered, it will essentially provide the planimetric reliefs and the reliefs of the horizons visible from these sites, showing how in some cases mountains/saddles/hills can be used to create useful calendar references.

This research activity, which began several years ago, it is part of a broader project aimed at studying the orientations of pre-protohistoric rock-cut tombs and sites in Sicily, places often reused in subsequent periods. (e.g. Orlando 2020).

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An Early Bronze Age open-air sanctuary at Troy with depiction of Orion constellation

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keywords: Troy; Turkey; skyscape; Early Bronze Age; sanctuary

ABSTRACT

Troy, in northeastern Turkey, is a UNESCO World Heritage Site, with universal value to humankind. One of its values is as a site where archaeological methods advanced from the 1870s to today (Blegen et al 1951; Pernicka et al 2014; Pernicka et al. 2016).

Carl Blegen's excavations at Troy during the 1930s were considered exemplary for the period, and therefore his documentation of an intriguing area named "The Ledge" are reliable; the Ledge is securely dated from its material culture to part of the long period called "Troy II" which represents the middle to late Early Bronze Age (EBA) in the context of prehistoric Western Anatolia. The Ledge measured approximately 6 meters in width and was at least 16 meters of length; the overhang of approximately 1.10 meters appeared to be a combination of a natural limestone feature with manmade cuttings to enlarge and regularize the space (M Rawson, unpublished 1932 excavation notebook) and so the feature could be considered either a rock shelter (abri or riparo), or the memory and recreation of such, from an earlier tradition.

During the 90 years since the discovery of The Ledge at Troy we have gained a new and better understanding of the signals for open air ritual activity (Richards & Thomas 1984; Holloway et al 1990; Bachhuber 2011). Blegen documented that for a period of several centuries, observants gathered at the Ledge for ritual feasting, carefully depositing the ceramic vessels and other objects there as part of their ritual actions.

Our renewed look at some of the objects deposited at the Ledge show that it was not just a place of local ritual observation, but that possibly people coming from places as far away as inland Anatolia and even Sicily may have known of the Ledge. Troy's location at a land/maritime crossroads may have made it a place where passage thanksgiving was offered to the deities of the Ledge.

We also asked the question: if the Ledge was such an important ritual place, what might its orientation and material culture tell us about the deities honored there? The short axis orientation of the rocky shelter site, on the west side of the hill of Troy, was to the north of northwest, with the long axis connecting the line from the summer solstice rise to the winter solstice set (Blegen et al. 1951, vol 1, part 2, figs 291 & 416).

Unfortunately more precise measurements cannot be made, because as the Blegen excavations removed the deposit in 1933, the fragile rock overhang collapsed onto the floor, and the site was never cleared or restored (D Rawson, unpublished 1933 excavation notebook). Nonetheless, we can suppose that the solstice solar/horizon phenomena might play a role (e.g. Cavulli et al in press). But the astronomical picture is even more interesting. At least two of the graffiti covered sherds that Blegen uncovered there show a figure that could be a representation of the Orion constellation (Blegen et al 1951, vol 1, part 2, fig. 371), one of them shown with much intriguing detail. This leads to an analysis of the time of year and day when observants would watch Orion setting over the Aegean, and what significance this could relay.

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Determination of spatial and astronomical vectors in the cromlech near the village of Dolni Glavanak, Madjarovo Municipality, Bulgaria by 3D modeling

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keywords: megalithic monument, cromlech, 3D modeling, drone technology, image processing

ABSTRACT

The cromlech near the village of Dolni Glavanak is an ancient megalithic structure from the Early Iron Age (VIII-VII centuries BC). It is built of 15 vertically placed large, roughly shaped blocks of hard volcanic rock (rhyodacite) with a height of 1.50 - 1.70 m and medium dimensions at the base - 0.80 × 0.50 m. The average width of each of them is about 1 m, at a thickness of 0.5 m. They are approximately 90 cm apart. The rock blocks form an irregular circle with a diameter of about 10 m. Between the vertical blocks, smaller blocks are placed horizontally (with a height of not more than 20-30 cm), all of which are situated directly on the rock base, without making special holes-bases for them (Mikov, 2002). An excellent panorama of the local horizon, which is with a zero height for observing sunrises and sunsets of bright celestial objects is evident from the center of the cromlech.

The archaeological research of the cromlech has established a cultural layer with a high concentration of archaeological materials (ceramics, animal bones, fragments of plaster, flint concretions) from the second phase of the Early Iron Age (Nehrizov, 2004, 2015).

The report presents visualization of the cromlech and analyses the three-dimensional spatial data obtained from photographs of the cromlech with a drone, which allows the extraction of archaeoastronomical data and their interpretation with greater accuracy. The monument shows oriented structural details to certain positions of the Sun during its sunrise, culmination and sunset at the points of summer and winter solstice, as well as spring and autumn equinoxes.

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New evidence relating to the naming of the planet Uranus

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keywords: Uranus, Urania, poems, coins, naming proposal, Jesuits, Vienna

ABSTRACT

When the planet Uranus was discovered in 1781, several European astronomers proposed a potential name for it. One of these astronomers was Jesuit Maximilian Hell (1720-1792), the first director of the University Observatory in Vienna (Austria). To promote his naming suggestion Urania, Hell composed the Latin poem *Lis Astronomorum de Nomine* ("The quarrel of the astronomers about the name"), which he published in the *Ephemerides astronomicae ad meridianum Vindobonensem* ("Ephemerides for the Meridian of Vienna") (Fig. 1). Hell had two accomplices: one of them, fellow Jesuit György Alajos Szerdahelyi (1740-1808) from Budapest also had a poetic vein and composed a Latin poem telling the *Historia Uraniae Musae*, the fictional "History of the Muse Urania". The second, hitherto seemingly anonymous accomplice had coins minted from platinum, which carried the name and symbol of Urania and sent them to Hell for use in his PR campaign. However, Maximilian Hell died before finding out who had the coins minted for him and long before the planet had an official name.

In this paper, I discuss a German version of that poem (Fig. 2), which is held in the Nachlass of Maximilian Hell in Vienna and can be attributed to Hell himself. I also present newly found letters, which prove that Jan Ingen-Housz (1730-1799), the discoverer of photosynthesis and then personal physician to Empress Maria Theresa, is the origin of the coins and that Maximilian Hell was unaware of this.

The study concluded that Hell's naming proposal Urania was discussed among a small circle of friends in Vienna and Budapest in the 1780s and that Maximilian Hell was enthusiastic enough about his Urania that he incited two of his closer friends to help propagate the name.

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The jewellery of Nordic Bronze Age women as a sign of astronomical knowledge

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ABSTRACT

Some pieces of jewelry are generally accepted to be more than just decoration. They are signs of social, political or religious status and only few selected persons are allowed to wear them. The neck collars and belt plates of Nordic Bronze Age women certainly belong to the most striking archaeological objects of that time and region. In previous work I have shown, that trigonometric measurement of the patterns on these pieces reveal astronomical knowledge on a highly developed level that has not been expected in this culture. In this presentation I would like to explore the reasons that led to my study and discuss the consequences of the outcome of it on the evaluation of the position of the women bearing this jewellery in Nordic Bronze Age society, as well as on the judgment of astronomical symbols in Nordic Bronze Age culture.

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Plato and the precession of the equinoxes

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ABSTRACT

The discovery of the precession of the equinoxes is attributed to Hipparchus (II sec. B.C.). Whose thesis was confirmed by Ptolemy (II sec.) who estimated a deviation of $2^{\circ}40'$ in 265 years, therefore 1° every 100 years and a precessional cycle that was completed in 36,000 ($100 \times 360^{\circ}$) years. A thesis that remained in vogue throughout the Middle Ages but "curiously" the precessional cycle was called Great Year or Platonic Year (Sacrobosco 1230~).

The idea that Plato (427-347 B.C.) may have referred to the precession of the equinoxes was proposed by James Adam, in his edition of the Republic (1902), established in 36,000 years the famous passage in the Republic (546) referred to the 'perfect number', just as, in the passage of the Timaeus (39), 'the perfect number of time fulfils the perfect year'. Adam connects the perfect number and the perfect year with the cosmic shifts mentioned in Politicus (268-274). Adam seeks confirmation of this in the fact that we find the period of 36,000 years sometimes actually called the 'great Platonic year' in early astronomical treatises, and infers that Ptolemy or some of his predecessors had understood the Platonic Number, and that we can perhaps trace the knowledge of the Number as far back as Hipparchus. Adam finds it difficult to believe that Hipparchus was uninfluenced by Plato's Number (Adam 1902: 302-305).

Adam's proposal was crushed by the prestigious astronomy historian Thomas Heath (1913). In more recent times it was revived by Giorgio de Santillana and Herta von Dechend (1969), but curiously the two historians of science made no reference to Adam's proposal, limiting themselves to pointing out that in Plato's dialogues there are passages that seem to refer to astronomical phenomena related to the precession of the equinoxes.

I came to the conclusion that the 36,000-year Perfect Year corresponded to the precessional cycle independently of Adam. Reading *La metafisica della storia in Platone* by Konrad Gaiser (1991), I understood that the periods (3,000, 9,000 and 36,000 years) that recur in Plato's tales, were in perfect harmony with the precessional cycle and with the epochal overturns between the seasonal and sidereal time to which Plato refers (Zedda 2023). Imagining an interpretative scenario in which the 3,000 years correspond to the time it would take the Υ and ω points to cross a zodiacal sign with the precession estimated at 36,000 years and the 9,000 years required to cross three, determining a situation in which the zodiac signs in conjunction with the equinoxes went to mark the solstices and vice versa.

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