Lilybaeum (Marsala) and the Major Lunar Standstill

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Here we discuss a possible astronomical orientation of the Decumanus Maximus of Lilybaeum (Marsala). Its direction is coincident to the northernmost direction of the moonset on a major lunar standstill.

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Marsala is an Italian town located in the Province of Trapani in the westernmost part of Sicily. The town was built on the ancient Lilybaeum, and includes in its territory the archaeological site of the island of Motya, an ancient Phoenician town.
In 397 BC, the Phoenician Motya was invaded and destroyed by Dionysius I, the Syracusan tyrant. The survivors founded a town nearby, which they called by a Punic name meaning "Town that Looks on Libya". This was recorded in Greek as Lilýbaion (Λιλύβαιον) and in Latin as Lilybaeum. It was at Lilybaeum that the Punic army landed and therefore the First Punic War began, in 265–264 BCE [1].
Actually, the Punic fortress Lilybaion was never conquered although it was besieged several times. In 241 BC it was given to the Romans as part of the peace treaty ending the First Punic War and became one of the most important towns in Sicily [1].
In today Marsala, Lilybaeum took up a rectangular area on Capo Boeo, a low and rocky promontory, which is sloping gently down towards the sea [1]. As told in [1], the urban layout of the town can be dated back to the 2nd century BC, taking the typical urban layout of a Roman camp. The modern-day Viale Vittorio Veneto is the Decumanus Maximus and Viale Cesare Battisti the Cardo Maximus [2]. Based on the archaeological findings at Capo Boeo, Marsala has been rebuilt twice, one time in the 1st century BC and another in the 3rd century AD [1].
In several articles and discussions [3-20], we have shown that many Roman towns had an astronomical orientation according to the sunrise/sunset, and some according to the moonrise/moonset. So let us investigate if, also in the case of the ancient town of Lilybaeum, we have such an astronomical orientation of its main axis, that is, of its Decumanus Maximus. Before this investigation, let us discuss a little about the motion of sun and moon in the sky.
Of all the objects of the sky, the sun is the fundamental one; it has a clear and simple apparent motion, characterized by solstices and equinoxes, and by the zenith passage in the tropical zone. From the winter solstice to the summer solstice, the sun increases its height in the sky and the angle between its rising and setting azimuths increases. It has an opposite behaviour from the summer solstice to the winter solstice.
The moon is obviously the other body attracting our attention: on the basis of its phases many aspects of the natural calendar had been devised. However, the motion in the sky of our satellite was, for the ancients, more complex to analyse. The moon does not behave like the sun, being more intricate and "moody". On each month, the moon is like the sun on a year. For 14 days, the moon behaves like the sun during the time period from the summer solstice to the winter solstice, decreasing its altitude in the sky and having rising and setting azimuths moving southwards. For the other 14 days, the moon behaves like the sun from the winter solstice to the summer solstice; the moon increases its altitude in the sky and the rising and setting azimuths move northwards.
A further complexity is due to the fact that, while the solar cycle is completed in 365 days, that of the moon lasts about 18.6 years (the Metonic cycle). During this cycle the moon has a major standstill; on it, the moon reaches its maximum declination North, so that the moonrise azimuth can be the northernmost possible one. In the same month, two weeks later, it has its rising at the southernmost possible azimuth, being closer to the South and lower on horizon. During the Metonic

cycle, a major standstill corresponds to the maximum declination of the Moon varying from roughly 28.5° to -28.5°, with a total movement of 57° (as explained by Wikipedia in the item on lunar standstills, "enough to take its culmination from high in the sky to low on the horizon in just two weeks"). After 9.6 years the moon has a minor lunar standstill; the moon will change its declination during the nodal period from +18.5° to −18.5°, which is a total movement of 37°, and then the angle spanned by the azimuth of moonrise and moonset is reduced to its minimum value. Wikipedia tells us that we had a minor standstill in October 2015, and that we will have a major standstill in April 2025. The past one was in June 2006.
To investigate a possible astronomical orientation of the main axis of Lilybaeum, let us use a software, which is showing sunrise / sunset and moonrise / moonset on satellite map. Let us use The Photographer's Ephemeris. We consider a major lunar standstill, in April 2025 and the northernmost direction of the moonset. The result is given in the Figure 1. In the Figure 2 we can see that, on a major lunar standstill, the northernmost setting has the direction which is passing between the islands of Marettimo and Favignana.

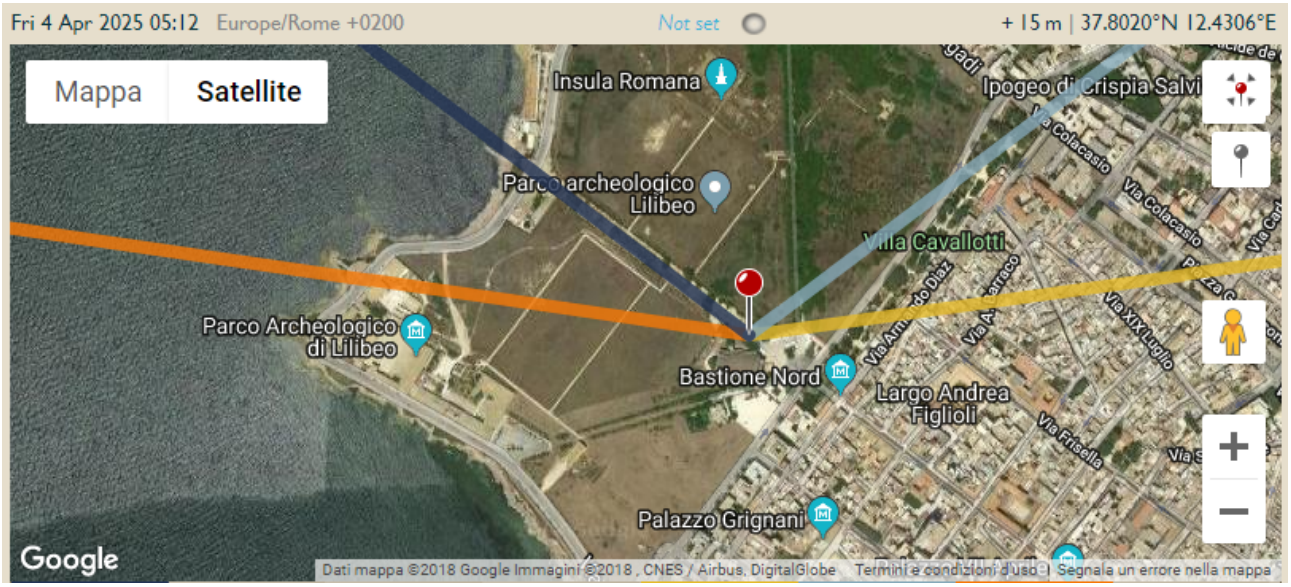

Figure 1: The Photographer's Ephemeris (TPE) is a software giving, besides the direction of sunrise and sunset (yellow and orange), also the directions of moonrise and moonset (pale blue and dark blue). We use the reference point, shown by a pin in the images, at one end of the Decumanus. The dark blue line, which shows the direction of the moonset, is coincident to the Decumanus.

Figure 2: On a major lunar standstill, the moon is setting along the northernmost direction which is passing between the islands of Marettimo and Favignana.

As we can see using the software, the direction of the Decumanus is coincident to the northernmost direction of the moonset on a major lunar standstill, that is, to the northernmost direction of setting that the moon can have during the Metonic cycle. This direction is also remarkable because it is passing between two islands (Figure 2). Therefore, the moon seems passing, during this moonset, through a "gate" on the horizon, symbolically represented by the two islands.

As told in [2], the layout that we see today is a Roman layout. However, it is possible that the Romans considered, and maintained, the orientation of the old Phoenician town. Aiming to find a reference to the Phoenician religion, let us shortly discuss about the chief deities of this people. It seems that they were Tanit and her consort Baal-hamon. Tanit was worshipped in the Western Mediterranean, [21,22], and she is considered equivalent to the moon-goddess Astarte, later worshipped in Roman Carthage in her Romanized form as Dea Caelestis, Juno Caelestis, or simply Caelestis. On coins, "Tanit se encontraría representada realmente por el signo astral y el creciente lunar" according to the "iconografía religiosa púnica de Tanit" [23].

Being Tanit a moon-goddess, a specific orientation of the Phoenician Lilybaeum according to the moon is possible, as a form of worship of this goddess. If it were so, the Romans had maintained the original astronomical orientation in honour of to moon as the Dea Caelestis. Let us note that, an astronomical orientation of another Phoenician town, Palermo, is observed [24]. Due to their different geographic positions, in the case of Palermo it was the sunrise direction on the summer solstice to determine the orientation; in the case of Lilybaeum, at the westernmost corner of Sicily, it was the northernmost moonset direction on a major lunar standstill to prevail.

References

[1] https://en.wikipedia.org/wiki/Marsala Consulted on 14 December 2018.

[2] Vento, Maurizio (1999). La topografia di Lilybaeum. Italy.

[3] Sparavigna, A. C. (2016). Roman Towns Oriented to Sunrise and Sunset on Solstices (May 8, 2016). SSRN. https://ssrn.com/abstract=2777118 or http://dx.doi.org/10.2139/ssrn.2777118

[4] Sparavigna, A. C. (2016). The Town Planning of Pompeii and Herculaneum Having Streets Aligned Along Sunrise on Summer Solstice (June 30, 2016). SSRN. https://ssrn.com/abstract=2802439 or http://dx.doi.org/10.2139/ssrn.2802439

[5] Sparavigna, A. C. (2017). Wien and the Winter Solstice (January 15, 2017). SSRN. https://ssrn.com/abstract=2899730 or http://dx.doi.org/10.2139/ssrn.2899730

[6] Sparavigna, A. C. (2017). Two Roman Towns in Germany Having a Solstitial Orientation of Their Urban Planning. Philica, Philica, 2017. 〈hal-01649826〉

[7] Sparavigna, A. C. (2017). Astronomical Orientations in the Roman Centuriation of Tunisia. 2017. HAL <hal-01543034>

[8] Sparavigna, A. C. (2017). L'antico tracciato urbano di Venafro ed il solstizio d'estate. 2017. HAL 〈hal-01538368〉

[9] Sparavigna, A. C. (2017). The Walled Town of Alife and the Solstices. Philica, 2017. Available HAL〈hal-01464777〉

[10] Sparavigna, A. C. (2017). The Solstices and the Orientation of the Roman Fort of Segontium (June 22, 2017). SSRN, http://dx.doi.org/10.2139/ssrn.2990995

[11] Sparavigna, A. C. (2014). Solstices at the Hardknott Roman Fort (December 17, 2014). PHILICA Article number 442. Available at SSRN: https://ssrn.com/abstract=2745184

[12] Sparavigna, A. C. (2017). The Ancient Norba and the Solstices (January 7, 2017). Available at SSRN: https://ssrn.com/abstract=2895354 or http://dx.doi.org/10.2139/ssrn.2895354

[13] Sparavigna, A. C. (2016). Augusta Emerita and the Major Lunar Standstill of 24 BC (July 10, 2016). PHILICA Article Number 635. Available at SSRN: https://ssrn.com/abstract=2807544

[14] Sparavigna, A. C. (2016). A Discussion on a First Foundation of Augusta Emerita as a Military Praesidium (July 30, 2016). PHILICA, Article 652. Available at SSRN: https://ssrn.com/abstract=2819623

[15] Sparavigna, A. C. (2016). A Possible Astronomical Orientation of the Curia Julia in the Forum

of Rome (July 19, 2016). PHILICA Article number 639. Available at SSRN: https://ssrn.com/abstract=2811625
[16] Sparavigna, A. C. (2016). Alcuni siti romani in Piemonte orientati coi lunistizi. May 2016. Philica
[17] Sparavigna, A. C. (2016). On the Orientation of the Roman Grumentum. January 2016 SSRN Electronic Journal. DOI: 10.2139/ssrn.2796722
[18] Sparavigna, A. C. (2016). Some Notes on the Urban Planning of Mediolanum and on the Orientation of Its Decumanus (May 12, 2016). Available at SSRN: https://ssrn.com/abstract=2779265 or http://dx.doi.org/10.2139/ssrn.2779265
[19] Sparavigna, A. C. (2016). Saint Ambrose and His Four Basilicas Guarding the Faith of Mediolanum (May 28, 2016). Available at SSRN: https://ssrn.com/abstract=2786142 or http://dx.doi.org/10.2139/ssrn.2786142
[20] Sparavigna, A. C. (2016). The Roman Saepinum Oriented to Moonrise on a Major Lunar Standstill (July 8, 2016). Available at SSRN: https://ssrn.com/abstract=2807105 or http://dx.doi.org/10.2139/ssrn.2807105
[21] https://en.wikipedia.org/wiki/Tanit Consulted on 16 December 2018.
[22] Markoe, Glenn E. (2000). Phoenicians. Berkeley: University of California Press. ISBN 9780520226142.
[23] Enrique Gozalbes Cravioto (2006). Las acuñaciones antiguas de Bailo: las leyendas. Arqueología, Aljaranda, 61. Junio 2006.
[24] Alessandro Di Bennardo (2017). Palermo città orientata. Il simbolismo astronomico della strada del Cassaro dalle origini fenicie alla rifondazione cinquecentesca. Atti del 19° Seminario di Archeoastronomia. Osservatorio Astronomico di Genova. 2017.