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URBAN PLANNING AND RITUAL ACTION IN *COLONIA ULPIA TRAIANA* (XANTEN, GERMANY): UNDERSTANDING A NON-SOLAR ORIENTATION PATTERN

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ABSTRACT

There is increasing evidence to suggest that cosmological factors were applied in the planning and orientation of Roman towns, at least under Augustus. Among others, this is the case of *Colonia Augusta Praetoria Salassorum* (Aosta) in *Italia*, *Colonia Urbs Iulia Nova Carthago* (Cartagena) in *Hispania Citerior Tarraconensis*, *Colonia Copia Claudia Augusta Lugdunum* (formerly *Colonia Copia Felix Munatia*, Lyon) in *Gallia Lugdunensis*, *Colonia Augusta Treverorum* (Trier) in *Gallia Belgica*, and *Colonia Claudia Ara Agrippinensium* (formerly *Ara Ubiorum*, Cologne) in *Germania Inferior*. For the sake of strengthening the sample of cities studied, and identifying orientation patterns from a chronological and astronomical perspective, a number of public structures from *Colonia Ulpia Traiana* (Xanten) in *Germania Inferio*r were measured. This town was a Roman colony, founded in A.D. 98 by Trajan with a contingent of veteran soldiers and a group of Germanic people. The result was the establishment of a typical Roman settlement with an orthogonal urban grid, whose planning and orientation took cosmological factors into account. In this case, in contrast to the previous examples, we propose that the *decumanus maximus* was not oriented directly according to the solar arc, but that instead it was possibly linked with other celestial bodies. In addition, the Gallo-Roman temple supposedly dedicated in this town to the *Matronae* or the *Matres* was oriented according to the major lunar standstill ("lunistice"). Therefore, this study aims to present the first results regarding the urban orientation of *Colonia Ulpia Traiana* according to a non-solar pattern, and attemps to provide a preliminary explanation for it from a cultural perspective.

KEYWORDS: Roman Towns, Urban Orientation, Limes Germanicus, Trajan, Matronae, Major Lunar Standstill, Venus.

1. INTRODUCTION AND RELATED WORK

The application of cosmological criteria in the orientation and planning of Roman towns has recently been identified in a number of case studies, such as *Colonia Augusta Praetoria Salassorum* (Aosta) in Italia (Bertarione and Magli, 2015), *Colonia Urbs Iulia Nova Carthago* (Cartagena) in *Hispania Citerior Tarraconensis* (González-García et al., 2015), *Colonia Copia Claudia Augusta Lugdunum* (formerly *Colonia Copia Felix Munatia*, Lyon) in *Gallia Lugdunensis* (García-Quintela and González-García, 2014), *Colonia Augusta Treverorum* (Trier) in *Gallia Belgica* (Espinosa-Espinosa et al., 2016), and *Colonia Claudia Ara Agrippinensium* (formerly *Ara Ubiorum*, Cologne) in *Germania Inferior* (Espinosa-Espinosa and González-García, 2017). In all of them, the apparent movement of the sun across the sky throughout the year would have been chosen (usually at sunrise) to mark important public festivals associated with human and agricultural cycles, as well as with several deities from the Roman pantheon, including the Emperor. The intention behind this practice would have involved the commemoration of specific public events that were deeply significant for the population, but also favouring prosperity and maintaining the political and religious cohesion of the local communities.

Despite what has been traditionally argued by scholars such as Joëll Le Gall (1975), Roman towns, at least under Augustus, seem to have been planned and oriented according to solar criteria (González-García et al. 2018). In Ancient Greece, this practice is implicit in Callimachus' *Hymn* (2, 55-57) to Apollo: "And Phoebus it is that men follow when they map out towns. For Phoebus evermore delights in the founding of cities, and Phoebus himself doth weave their foundations." Regardless of whether the design of towns in the Roman world were subject to a series of empirical guidelines that were intended to provide the healthiest possible conditions for the people who lived in them –as we know from Vitruvius (*De arch*. 1, 4–6) and Cicero (*De Rep*. 2, 5–11)–, cosmology seems to have been a fundamental conditioning factor which determined the orientation of towns. This discipline, included by Vitruvius (*De arch*. 1, 1, 10) among the skills that an architect had to cultivate with the aim of knowing "the points of the heavens, the laws of the celestial bodies, the equinoxes, solstices, and courses of the stars," generates a series of ideas and beliefs that are expressed in different ways in the spheres of culture and religion. According to these, human beings view the world in a specific way, a situation that affects the manner in which space and life in society (i.e., the city) are understood and organized (Rykwert 1988; Carandini 2003; Humm, 2004; De Sanctis, 2012; Gargola, 2017). In the case of Rome, following Maurizio Bettini (2011: 91), "[the Romans] created a cosmogony in virtue of the *mundus*, which related their city to the celestial vault and to the realm of the dead, while the circular form of the furrow, together with the *pomoerium*, recalled the form of *orbis* that the city of Rome in some way reproduced."

2. *COLONIA ULPIA TRAIANA* (XANTEN, GERMANY)

Colonia Ulpia Traiana has been chosen as a new case study for the sake of strengthening the sample of towns studied, testing the application of cosmological criteria in Roman towns after Augustus, and identifying orientation patterns from a chronological and astronomical perspective. This Roman colony was founded in A.D. 98 by Trajan, nearly a century after the above mentioned towns, with a contingent of veteran soldiers and a group of *Cugerni/Baetasii* (Müller et al., 2008: 243-255; Eck, 2014; Schalles, 2014). *Colonia Ulpia Traiana* is located in modern Xanten (Germany), in the heart of present-day Europe (Figure 1). Due to its latitude (51 degrees north), it is one of the most northerly Roman towns in the area, together with *Ulpia Noviomagus Batavorum* (Nijmegen, in the Netherlands). *Colonia Ulpia Traiana* was established close to an ancient branch of the River Rhine, in the centre of a large river plain. It was connected with the mouth of the river and the capital of *Germania Inferior* (*Colonia Claudia Ara Agrippinensium*) by a Roman road that ran from north to south to the right of the *limes Germanicus*.

As regards its historical context, Trajan (A.D. 98-117) founded *Colonia Ulpia Traiana* in his own honour after being acclaimed *Princeps* in *Germania Inferior* following the death of his adoptive father, Nerva (Müller et al., 2008: 243-255; Eck, 2014: 106 and 109; Schalles, 2014: 126-131). This settlement, with an area of 73 ha, was the second Roman colony of *Germania Inferior* after the founding of *Colonia Claudia Ara Agrippinensium* by Claudius in A.D. 50. According to scholars such as Werner Eck (2014: 108), *Colonia Ulpia Traiana* would have been a demonstration of power by Trajan, due to its large dimensions and the fact that he was assured the loyalty of the war veterans and local auxiliaries who had settled there. As a result, as Werner Eck has suggested, Trajan would have created a permanent monument in honour of his imperial beginnings in this province (Eck, 2014: 108).

Like all new Roman towns, *Colonia Ulpia Traiana* had an orthogonal urban layout that was determined by the course of the River Rhine at that time. The

Roman authorities built whatever was needed to enjoy a comfortable and quiet life: a solid town wall, a forum, a river port, an amphitheatre, *domus* (houses), *tabernae* (shops), wide streets with a sewer system, public baths, and temples (Müller et al., 2008: 277-470). The countryside surrounding the colony produced cereals and legumes (among other crops) together with cattle, sheep and pigs, and so it can be assumed that apart from the veterans, most of the people from *Colonia Ulpia Traiana* were farmers and peasants, mainly of Gallo-Germanic origin (Müller et al., 2008: 21-48; Derks, 1998: 55-66).

Figure 1. Location of Colonia Ulpia Traiana. Map: GifeX.

3. ARCHAEOASTRONOMICAL MEASUREMENTS

The methodology employed involves measuring the archaeological remains that may help to identify the orientation of the urban layout. After determining the direction from which the orientation was based, the azimuth and the horizon altitude are taken for this direction, using tandems that include a precision compass and a clinometer. As the instruments used are magnetic, the magnetic declination readings are corrected. When this type of reading is not possible, the magnetic declination is estimated for the fieldwork dates from the models available from the National Oceanic and Atmospheric Administration website.[1] The data can then be compared with estimates for the celestial objects visible in this section of the horizon. To perform this comparison, our measurements are converted into astronomical declinations, resulting in an error estimate of approximately one day in the case of the sunrise/sunset. When the horizon is blocked due to the presence of modern buildings, a digital terrain model is used to reconstruct the horizon.[2]

To calibrate the orientation of the structures in *Colonia Ulpia Traiana*, measurements were taken in situ in different parts of the town. The areas that were measured included the north gate, the *cardo maximus*, the *decumanus maximus*, several *cardines* and *decumani minores*, the town baths, the *Hafentempel*, the forum, the *capitolium*, the *Matronentempel*, the amphitheatre, and the town wall. Based on an orthogonal urban layout, the purpose of gathering data in these areas is to examine a wide and representative sample of measurements, and to verify the existence of a correlation between them within a reasonable margin of error. Once these data were analysed, the urban orientation was established according to the direction of the *cardines* and *decumani* as shown below (Table 1).

Table 1. Astronomical orientation results of Colonia Ulpia Traiana.

***Colonia Ulpia Traiana* Lat. 51º 40′N**	**A (±¼º)**	**h (±½º)**	δ (±0.75º)	**Event**
Cardines	134º	½º	−25.5º	Moon?
Cardines	314º	0º	25º	Moon?
Decumani	44º	0º	26º	Moon?
Decumani	224º	0º	−27º	Venus/Moon?

The columns show the structure measured, the azimuth (A), the horizon altitude (h), and the calculated astronomical declination (δ). The last column shows the possible astronomical event or date. In view of the results, there are two aspects that stand out. On the one hand, *Colonia Ulpia Traiana* has a rather peculiar orientation, where neither the *cardines* nor the *decumani* face the rising or setting sun. This is one of the few Roman towns studied that was oriented according to this type of pattern. Although we would expect that cardinal orientations would be the most common orientation for Roman towns, according to what the *agrimensores* prescribed (see e.g. Front., *De limit.* 8, 30-33; 10.27-28), the most common orientation of the Roman towns studied to date is actually towards sunrise at the winter solstice (WS) (see for example González-García and Magli, 2015; Rodríguez-Antón et al., in this volume). We would therefore argue that in this case it seems as if the Roman *agrimensores* would have planned an orthogonal layout according to true north, but rotated 45º towards the east (i.e., bisecting a 90 degrees angle)

[1] http://www.ngdc.noaa.gov/geomag-web/

[2] http://www.heywhatsthat.com/

for reasons as yet unknown. Perhaps the ancient course of the River Rhine (the end of the sewer system), or even a previous Julio-Claudian settlement, may have determined this choice (Müller et al., 2008: 171-209; Schalles, 2014: 114-117). Despite this, the orientation of the *decumani* towards the northwest and southwest could be compatible with events related to the moon (as they are facing a part of the horizon where the sun does not rise or set, but where the moon does) and Venus, in particular with the cycle of Venus and the movements of this planet in the sky (synodic period). Interestingly, this possibility can be seen more clearly in the south-western horizon, as the planet has a larger visible elongation towards the west than the east with respect to the sun on the horizon (see e.g. Sprajc, 2015).

In addition to the urban orientation, it is interesting to consider the orientation of a significant religious building that would have played an important role in the daily life of the *Traianenses*. This is the so-called *Matronentempel* (*Matronae* temple) whose stone foundations are still preserved today (Freigang, 1991; Zille 1995; Müller et al., 2008: 319-324). This building was a Gallo-Roman temple designed according to the Celtic tradition, which has a slight but clear deviation from the orthogonal layout orientation. In this respect, the orientation of this temple, based on its two axes of symmetry, is as follows (Table 2):

Table 2. Astronomical orientation results of the Matronentempel in Colonia Ulpia Traiana. The temple entrance is along the major axis, facing the Northern Major Lunistice.

Matronentempel Lat. 51° 40′N	A (±¼°)	h (±½°)	δ (±0.75°)	Event
major axis	38 ½°	0°	28.5°	NML
major axis	218 ½°	0°	−29.8°	SML
minor axis	128 ½°	0°	−23.2°	WS
minor axis	308 ½°	0°	22.2°	- - -
major *temenos* wall	38 ½°	0°	28.5°	NML
major *temenos* wall	218 ½°	0°	−29.8°	SML
minor *temenos* wall	131 ½°	½°	−24.2°	WS
minor *temenos* wall	311 ½°	0°	23.8°	SS

The major axis is oriented toward moonrise at the Northern Major Lunistice (NML) in winter, as well as towards the setting of the moon at the Southern Major Lunistice (SML) in summer (Figure 2). In contrast, the minor axis is aligned toward the sunrise at the Winter Solstice (WS). The latter is also the orientation of the minor *temenos* wall, as well as towards the Summer Solstice (SS). As can be seen, the orientation of the *Matronentempel* is extremely complex as it combines a Roman solar orientation and what is probable a Gallo-Germanic lunar orientation, something that has been documented in Gallo-Roman temples such as the *Lenus Mars* temple in *Colonia Augusta Treverorum* (Espinosa-Espinosa et al., 2016: 236-238). For the sake of brevity, we will focus our attention on the lunar orientation of the temple, in an attempt to understand its cultural significance.

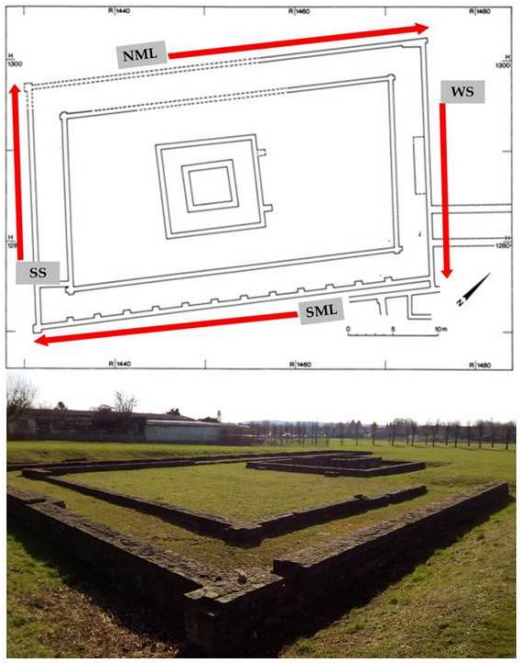

Figure 2. Matronentempel enclosure. Plan: Zille 1995: 107. Photo: David Espinosa-Espinosa.

Finally, as in the previous case, the so-called *Hafentempel* (harbour temple) also had a different orientation of the minor *temenos* wall in relation to the minor axis (Müller et al., 2008: 315; Schalles, 2014: 116-117). This building was a hexastyle Roman temple surrounded by columns (*peripteros*) with podium, adapted to the orthogonal orientation of the urban layout. The orientation of the *Hafentempel* enclosure, whose titular deity is unknown (presumably *Mars* or the deified Trajan) (Müller et al., 2008: 311-318), is as shown below (Table 3):

Table 3. Astronomical orientation results of the Hafentempel in Colonia Ulpia Traiana.

Hafentempel Lat. 51° 40′N	A (±¼°)	h (±½°)	δ (±0.75°)	Event
major axis	134°	½°	−25.5°	Moon?
major axis	314°	0°	25°	Moon?
minor axis	44°	0°	26°	Moon?
minor axis	224°	0°	−27°	Venus/Moon?
major *temenos* wall	134°	½°	−25.5°	Moon?
major *temenos* wall	314°	0°	25°	Moon?
SE minor *temenos* wall	41°	0°	27.5°	Moon?
SE minor *temenos* wall	221°	0°	−28.4°	SML
NW minor *temenos* wall	39 ½°	0°	28°	NML
NW minor *temenos* wall	219 ½°	0°	−29.1°	SML

The temple's major and minor axes, as well as the major *temenos* walls, have the same orientation as the urban layout. However, the minor *temenos* walls have a different orientation. According to the astronomical hypothesis, these orientations would coincide with moonrise on the Northern Major Lunistice (NML) during winter and towards moonset at the Southern Major Lunistice (SML) during summer (Figure 3), in the same way as the major axis and the major *temenos* walls of the *Matronentempel*. To date, no plausible explanation has been found for these differences in orientation. In any case, no indications of a previous sacral use of the area as a possible reason for this design have been found (Müller et al., 2008: 315). The answer to this problem is to try to understand this orientation pattern according to astronomical criteria based on religious reasons.

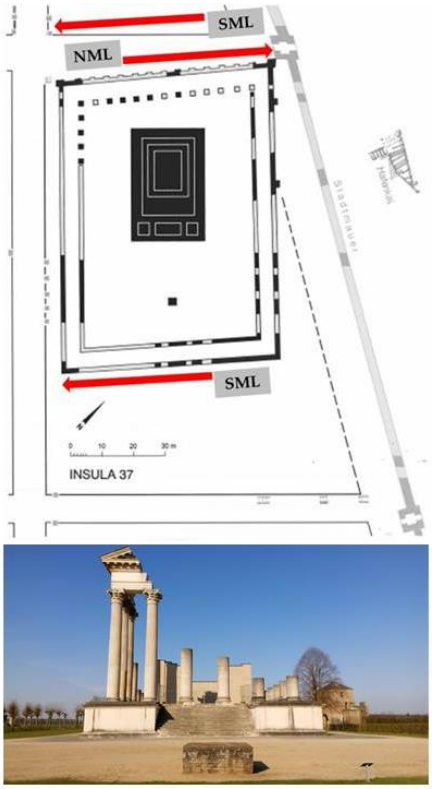

Figure 3. The Hafentempel enclosure. Plan: Müller et al., 2008: 314. Photo: David Espinosa-Espinosa.

4. DISCUSSION

In light of what we have seen in this paper, it is not easy to establish a reliable proposal to interpret these results. On the one hand, in the case of the urban orientation, the *decumanus maximus* of *Colonia Ulpia Traiana* was not oriented in direct compliance with the solar arc, but could be related to a cardinal orientation skewed by 45º. More speculatively, it could also be related with the apparent movement of the moon and/or Venus across the sky. This is both interesting and possibly intentional as the so-called *nova urbs* of *Italica* (Santiponce, Spain) in *Hispania Citerior Tarraconensis* has a quite similar orientation (González-García et al., 2014: 118). Located at a latitude of 37º 26′ N, the azimuth of the *decumanus* is 57 ¾° towards the eastern end and 237 ¾ towards the western parts, which translate into declinations of 25º and -24º respectively. Indeed, the orientations differ by some degrees, but it is remarkable that despite the difference in latitude and azimuth both towns seem to be facing similar parts of the sky, in any case slightly outside of the solar arc. This circumstance is highly significant and suggestive as *Italica* (Trajan's birthplace) became a Roman colony under Hadrian, his successor (Aul. Gell. *Noct. Attic.* 16, 13, 4). Unfortunately, due to the lack of references in ancient texts, we do not know what could have been the meaning of the moon and/or Venus as the evening star for the people of *Colonia Ulpia Traiana*, or with which political, religious, or seasonal event it was associated. However, based on the results from the *Matronentempel*, it is possible to suggest a likely working hypothesis, at least about the moon.

In this respect, it seems to be no coincidence that this temple was consecrated to the *Matronae*, probably the *Matronae Aufaniae* based on epigraphic remains dedicated to these goddesses (Figure 4) (Clauss, 1976: 30 nº 45; *AE* 1977, 566; Freigang, 1991: 119; Müller et al. 2008: 319-324). The *Matronae* (the "matrons"), identified with the *Matres* (the "mother-goddesses") (*contra* Garman, 2008: 34 and 85-86), were Celtic female deities venerated in Cisalpine Gaul, *Gallia Narbonensis*, *Tres Galliae*, the Rhineland, *Hispania* and Britain from the first to the fifth centuries A.D. (Thévenot, 1968: 165-176; Bauchhenss and Neumann, 1987: 1-30 and 242; Raepsaet-Charlier, 1993: 33-36 and 2015: 204-217; Derks, 1998: 119-130; Gómez Pantoja, 1999; Zaccaria, 2004; Garman, 2008: 17-19 and 29; Bermejo, 2014). They were depicted in many votive altars (asking for protection for the family, fertility or professional success, or giving thanks for being saved from danger or illness), reliefs and statuettes in groups of one, two or three in both sitting and standing position, dedicated by people of indigenous or Roman origin, including women and members of the civil and military Roman administration (Thévenot, 1968: 167-176; Garman, 2008: 44-45 and 68-69).

As regards the attributes and their accompanying symbols, the representation of the *Matronae* tends to emphasize general fertility and wealth, while the *Matres* are depicted with strongly reproductive imagery (Garman, 2008: 30 and 35). The *Matronae* appear holding baskets of fruit, loaves of bread, purses of coins, and weaving equipment, while the *Matres* hold children on their laps and napkins (as in the case of the *Matres* of Vertault, Côte-d'Or, France): the

first one holds a child wrapped in swaddling clothes, the second one a baby's flannel blanket, and the third one a washbowl and a sponge (Figure 5: A) (Aldhouse-Green, 2004: 73-74). Another difference between them is that the *Matres* are shown as three women who are similar in age and dress, while depictions of the *Matronae* show them as being of different ages, garbed appropriately to their age and status (Aldhouse-Green, 2004: 74 and 203-204; Garman, 2008: 31). The latter is clear in the case of the *Matronae Aufaniae* from Bonn/Cologne: two middle-age women, wearing huge circular headdresses, flank a young girl with a footstool, bare head, and long flowing hair (Figure 5: B). They are seated on a high-backed bench covered by cushions and blankets. The two older women are wearing neck ribbons or necklaces with pendants shaped like half-moons (Aldhouse-Green, 2004: 203; Garman, 2008: 35). All three hold baskets of fruit or bread. However, regardless of these differences, the *Matres* and the *Matronae* share some common elements which are usual in the representations of the maternal figures of the Roman/Italic pantheon such as *Fortuna/Tyche*, *Iuno* and *Mater Matuta*: the *cornucopia* or horn of plenty, the *patera*, the globe and the rudder. In fact, *Fortuna* was depicted as a "nursing mother" (*kourotrophos*) in the statue of the baby Jupiter sitting together with his sister Juno on the lap of *Fortuna*, reaching for her breast (Cic. *De Div*. 2, 85), and her worship was related to that of *Mater Matuta* in the area of Sant'Omobono (Gagé, 1963: 25-26, 57 and 228-235; Champeaux, 1982a: 257-265 and 314-317). All of these elements appear to indicate that the *Matres* and the *Matronae* were related to fertility, prosperity, nourishment, the passage of time, fate, growth, and protection (Thévenot, 1968: 167-178; Champeaux, 1982a: 46; Aldhouse-Green, 2004: 74-76 and 203-205; Bermejo 2014).

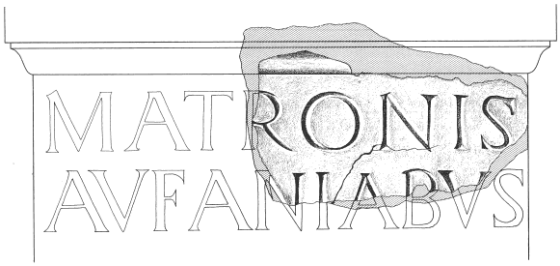

Figure 4. Votive inscription to the Matronae Aufaniae from the Matronae temple in Colonia Ulpia Traiana (AE 1977, 566). Picture: Müller et al., 2008: 323.

Having established the link between the *Matronae* and *Fortuna*, it is easier to understand the role that was probably played by the moon in the orientation of the *Matronentempel* in *Colonia Ulpia Traiana* and possibly, by extension, of the urban layout. In this respect, according to Leonardo Magini (2015: 27), *Fortuna* had lunar characteristics. In fact, this goddess, identified with the moon, facilitated the encounter between *Mars* and *Rhea Silvia* eclipsing the sun (Plut. *De Fort. Rom*. 8; *Rom*. 12, 5). Also, according to this scholar, the rapid succession of the moon's changing appearance is embodied by three divine figures in the Roman religion: *Fortuna* and her two handmaidens, *Necessitas*, who precedes her and *Spes*, the last of the goddesses (Hor. *Od*. 1, 35). They would be represented in the heavens respectively by the new moon, the waning moon, and the waxing moon, equated with *Fortuna caeca*, *Fortuna Respiciens* and *Fortuna Obsequens* (Magini, 2015: 27-31). These goddesses would have precisely played an important role as tutelary and benefactor deities (Champeaux, 1982b: 97-105 and 115).

Figure 5: A. Relief of the Matres from Vertault (France). Photo: Alhouse-Green, 2004: 74. B. Votive altar to the Matronae Aufaniae from Bonn (Germany) (AE 1930, 19). Photo: Epigraphik-Datenbank Clauss-Slaby EDCS.

Finally, *Fortuna*, *Mater Matuta* and *Iuno*, closely related to the *Matronae* and the *Matres* as shown above, were intimately connected with the reproductive cycle, the growth stages, and the moon. In this sense, both goddesses celebrated their feast on June 11, i.e., the day of the *Matralia*. For the Romans, this was the most auspicious day for conception (Gagé, 1963: 21 and 25; Dumézil, 1974: 66-72 and 343-344; Champeaux, 1982a: 250, 281-333; Magini, 2015: 47). Based on this date, the ideal day to be born coincides on March 9 (273.25 days later). In Rome, no public feast was held on that date, since the birth of a common citizen remained a private event. However, two feasts were held one *nundina* before and one *nundina* after March 9 (Macr. *Sat*. 1, 16, 36). In the *nundina* before birth, on March 1, pregnancy completes the 9th and enters the 10th lunar month. As Macrobius (*Sat*. 1, 8, 5) explains, this is the moment when "in the uterus the fertilized seed ripens into life in the 10th month, retained by delicate natural bonds until it issues into the light." This is the moment when, approaching the start of labour and all the associated perils for mothers and newborn infants, the feast of *Matronalia* consecrated to *Iuno Lucina* was celebrated, marking the start of the lunar year at the Calends of

the first month of the year (Gagé, 1963: 5, 13 and 66-80; Dumézil, 1974: 302-310; Cid, 2007; Magini, 2015: 54). As noted by Georges Dumézil (1974: 302-303), "la déesse de l'enfantement preside aussi au début du mois, à la 'renaissance' de la lune." On the other hand, the *nundina* after birth, on March 17, was the moment when males born on March 9 underwent the ritual of purification and naming. This *dies lustricus* coincides with the feast of *Liberalia*, when the birthday of those born at the same time and in the same age group was celebrated, and fertility rites were made to *Ceres, Liber* and *Libera* (Dumézil, 1974: 382-385; Magini, 2015: 55).

Based on the above, the orientation of the *Matronentempel* in *Colonia Ulpia Traiana*, and also possibly the urban layout according to the apparent movement of the moon across the sky, may have become astronomical markers related to natural and human reproductive cycles associated with procreation and birth, among other aspects. As Ton Derks (1998: 55) has proposed for the northern part of Roman Gaul, religious concepts and practices could have been interwoven with specific characteristics of the landscape and the daily life of the majority of the population in the rural parts of Northern Gaul. This seems reasonable as most of the people that lived in this town would have been farmers and peasants. There is therefore a clear correspondence between all the data. Dispensers of fruits and nurses of newborn children, the beneficial action of the *Matronae* and the *Matres* would have been essential to human, animal and plant life. As *Fortuna*, *Mater Matuta* and *Iuno Lucina*, they would have had an immediate and specific impact on reproductive forces. The moon, included on the pendants that adorn the depictions of the *Matronae*, must have played crucial role in the myth and ritual action of their worship, as well as in the continuation, cohesion, control, and prosperity of the political and human community, to the point that its celestial movements may have served to define the orientation of the *Matronentempel* and the urban layout of *Colonia Ulpia Traiana*.

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