



# The Basis of Hellenistic Bounds and Medieval Terms in Prime Numbers

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***By David Cochrane***

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# **The Basis of Hellenistic Bounds and Medieval Terms In Prime Numbers**

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October, 2014

## **Ancient Divisions of the Ecliptic Plane**

A zodiac of twelve equally spaced zodiac signs is often considered to have been developed around the 7<sup>th</sup> century BC<sup>1</sup>. However, the division of the ecliptic plane into equally spaced sections has a history going back to at least around 1700 BC, as evidenced by this statement in the Rig Veda: “*The wheel of law with twelve spokes does not decay as it revolves around heaven. Ob Fire, here your 720 sons abide.*”<sup>2</sup>. In the context of this statement in the Rig Veda it appears clear that the wheel of law being referred to is the ecliptic plane and the twelve spokes are divisions of the ecliptic plane. Spokes of a wheel are normally equally spaced and there are no indications in the text that the spokes are not equally spaced.

What the precise effect is of an ecliptic plane divided into twelve equal divisions may be is not clearly stated but one can reasonably assume that different astrological significance may be applied to these twelve sections, and thus we may have the rudiments (or possibly even a well developed astrological system) going back more than 1,000 years prior to what has been assumed.

Because Indian astrological ideas were transmitted primarily verbally and the destruction of libraries and other historical artifacts has left relatively little left, there are relatively few primary sources upon which to construct our understanding of ancient astrology. However, the statements in the Rig Veda appear to suggest the existence of equal divisions of the ecliptic plane prior to the revival of astrology in the area of Babylonia in the time period of 700 BC to 200 BC.

The very rapid development of complex astrological theory within what appears to be a few hundred years of about 500 BC to 200 BC is startling. If, however, this time period of the flourishing of astrological rules was based on a larger foundation of ideas than previously thought, then we can consider this time period to be a period of revival and rapid development of astrological theory rather than the invention of many astrological ideas without any precedent. As noted above, there is strong evidence that the concept of equal divisions of the ecliptic plane into some kind of zodiac or symbolic language at least 1,000 years earlier.

The Rig Veda references other divisions of the zodiac as well. The “720 sons” referred to in the quote given above, for example, may possibly refer to divisions of the ecliptic plane into one-half degree sections. Some of the earliest extant astrological writings provide meanings for each degree of the zodiac.<sup>3</sup>

The division of the zodiac into 36 decans of 10 degrees each is another example of other divisions of the zodiac other than 12. Fundamental to this concept of divisions of the

ecliptic plane is that 360 is not an arbitrary number; there is a natural law, a natural force or innate pattern that defines these divisions of the ecliptic plane; the Rig Veda is unequivocal about this; it is the “wheel of law”.

### **The Hellenistic Bounds (Medieval Terms)**

One of the most peculiar of the divisions of the zodiac are the bounds as they are referred to by many contemporary Hellenistic astrologers, and referred to as terms by many contemporary classical astrologers. What makes the bounds peculiar is that they are not equally sized.

There are 5 terms in each zodiac sign but they vary in size. A planet is assigned to each bound and there is a general structure to the way the planets are assigned to bounds but any logic or system to the details of the bounds is difficult to fathom. There are variations in the system of bounds.

Given below are the Ptolemaic terms. These are copied here from the website of astrologer Lee Lehman.<sup>4</sup>

**Ptolemaic**

♈	0 ♃ 6	6 ♀ 14	14 ♁ 21	21 ♂ 26	26 ♄ 30
♉	0 ♀ 8	8 ♁ 15	15 ♃ 22	22 ♄ 26	26 ♂ 30
♊	0 ♁ 7	7 ♃ 14	14 ♀ 21	21 ♄ 25*	25 ♂ 30*
♋	0 ♂ 6	6 ♃ 13*	13 ♁ 20	20 ♀ 27*	27 ♄ 30
♌	0 ♄ 6*	6 ♁ 13*	13 ♀ 19*	19 ♃ 25*	25 ♂ 30
♍	0 ♁ 7	7 ♀ 13	13 ♃ 18	18 ♄ 24*	24 ♂ 30*
♎	0 ♄ 6	6 ♀ 11*	11 ♃ 19	19 ♁ 24*	24 ♂ 30
♏	0 ♂ 6	6 ♃ 14*	14 ♀ 21*	21 ♁ 27*	27 ♄ 30
♐	0 ♃ 8	8 ♀ 14	14 ♁ 19	19 ♄ 25	25 ♂ 30
♑	0 ♀ 6*	6 ♁ 12*	12 ♃ 19*	19 ♂ 25*	25 ♄ 30*
♒	0 ♄ 6*	6 ♁ 12*	12 ♀ 20*	20 ♃ 25*	25 ♂ 30*
♓	0 ♀ 8	8 ♃ 14	14 ♁ 20	20 ♂ 26	26 ♄ 30

*Table 1*

## Prime Numbers and Hellenistic Bounds

Prime numbers are approximately symmetric within each zodiac sign, but there are “gaps” where the prime number “partner” is missing. These are malefic areas. The table below shows the arrangement of prime numbers around the center of each zodiac sign.

Pair:	First		Second		Third		Fourth	
Distance from center:	-14	-8	-4	-2	+2	+4	+8	+14
Degree of zodiac sign:	1	7	11	13	17	19	23	29
Aries	1	7	11	13	17	19	23	29
Taurus	31	37	41	43	47		53	59
Gemini	61	67	71	73		79	83	89
Cancer		97	101	103	107	109	113	
Leo		127	131		137	139		149
Virgo	151	157		163	167		173	179
Libra	181		191	193	197	199		
Scorpio	211			223	227	229	233	239
Sagittarius	241		251		257		263	269
Capricorn	271	277	281	283			293	
Aquarius		307	311	313	317			
Pisces	331	337			347	349	353	359

*Table 2*

In the table shown above all prime numbers between 1 and 360, with the exception of 2, 3, and 5 are listed as zodiac degree positions. The number 1 is included in the table even though modern mathematicians do not consider the number 1 to be a prime number.

To help understand this table, let’s consider the zodiac sign Taurus, which extends from 30 to 60 degrees. The prime numbers in the sign of Taurus are 31, 37, 41, 43, 47, 53, and 59. These numbers are symmetric around the middle of Taurus except that 41 (which = 45 – 4) does not have a prime number pair at 49 (which = 45 + 4). The number 49 = 7 x 7 so it is not prime.

The numbers 2, 3, and 5 are the foundation for this table ( $2 \times 3 \times 5 = 30$ ) and they are not included in the table. This table is another perspective on how ancient astrologer-mathematicians may have viewed the fundamental importance of the first prime numbers as intricately connected to the “wheel of law”, i.e., to the building of the “spokes” that divide the ecliptic plane into 12 equally sized divisions of 30 degrees.

The places where a prime number is missing (such as 49, or, in other words, 19 degrees of Taurus), are not based on the fundamental prime numbers of 2, 3, and 5. They are numbers that dance to the beat of a different drum, so to speak. The number 49 brings the qualities of 7 instead of a prime number. Prime numbers are benefic and the lack of a prime number at

the balancing point creates a change to the otherwise perfectly balanced system. This change or variation is not malefic in an evil sense but rather creates a bit of dissonance or a peculiar quality that makes life challenging and interesting.

The 19<sup>th</sup> degree of Taurus is peculiar or malefic and a malefic planet is assigned to it. There is a hole in the table and the hole is filled with a malefic planet because malefic planets help us work with situations that lack perfect symmetry, balance, and equilibrium. One can also give an orb to this 19<sup>th</sup> degree and look at the area from 14 to 22 degrees of Taurus. This is the area that would “normally” be filled with a prime number but instead a number that is outside the fundamental prime numbers of 2, 3, and 5 resides in this part of the zodiac.

There are specific rules for which holes in the table are most important and these are described in the next section of this paper.

The above explanation of how malefic planets are assigned to degree areas is a conjecture as to how ancient astrologers who devised a system of bounds may have been thinking.

## **Hypothetical Rules for Determining the Hellenistic Bounds**

The **first** rule for identifying the bounds is obvious: each zodiac sign is divided into 5 sections and each section is assigned one of the visible planets. Within each zodiac sign each of the 5 visible planets is assigned to one bound.

The **second** rule is that the order of the planets is from greatest benefit to greatest malefic: Jupiter – Venus – Mercury – Mars – Saturn. The underlying concept appears to be that the twelve spokes (as the beginning of each of the 12 zodiac signs is referred to in the Rig Veda) are good and their benefic quality radiates forward in the zodiac and fades as one progresses through the 30 degrees of the zodiac sign. This second rule sets an overall pattern and exceptions to this pattern are a result of the third rule described below.

The **third** rule is that a missing symmetric prime number in one of the first two of the eight expected prime numbers of the zodiac makes the first bound malefic. Referring to the table of prime numbers given below, notice that 6 zodiac signs have a missing prime number as one of the first two prime numbers in the table: Cancer, Leo, Libra, Scorpio, Sagittarius, and Aquarius. Five of these six zodiac signs have a malefic assigned to the first bound. The only one that does not, Sagittarius, is a result of the fourth rule given below.

The **fourth** rule is that a missing prime number in the 3<sup>rd</sup> pair of prime numbers makes the 4<sup>th</sup> bound doubly malefic (it is naturally malefic as well as malefic by having a missing prime number) and this strengthens the tendency to be assigned a malefic planet.

The **fifth** rule is that the 5<sup>th</sup> bound is always malefic (assigned to Mars or Saturn)

## **Simplified Rules for Determining Which Bounds are Malefic**

The rules for determining which bounds are assigned to the two malefic planets are much simpler:

- 1. The 5<sup>th</sup> bound is always assigned to a malefic. This is the end of the zodiac and nothing can make it benefic.
- 2. A hole in the first pair of prime numbers makes Mars or Saturn the first bound. If Mars or Saturn has dignity (ruler, exaltation, detriment or fall), the dignified planet is assigned to the first bound.
- 3. A hole in the third pair of prime numbers makes the fourth bound highly malefic. Usually Saturn is assigned to the fourth bound but a planet with dignity in the sign may also be assigned to the fourth bound
- 4. If there is a hole in both the first pair and third pair of planets, then there is a rule for breaking the tie, i.e., determining whether the first or fourth bound is malefic: the first bound is assigned to the ruler of the zodiac sign and the 4<sup>th</sup> bound is malefic.

When we apply these rules to the zodiac signs, all 12 zodiac signs fit the rules! Let's see how the rules apply to each zodiac sign:

**Aries (♈):** As noted above, there are no holes in the table so there are no changes to the natural order of the planets. Aries, the first zodiac sign, sets the archetypal pattern and has no disturbances to the natural pattern.

**Taurus (♉):** Only rule #3 applies and the doubly malefic 4<sup>th</sup> bound is assigned the most malefic planet, Saturn, as expected.

**Gemini (♊):** Identical to Taurus, only rule #3 applies and the result is the same: Saturn is assigned to the 4<sup>th</sup> bound as expected.

**Cancer (♋):** Only rule #2 applies and a malefic, Mars, which is in fall in Cancer, is assigned to the first bound, as expected.

**Leo (♌):** As with Cancer, only rule #2 applies and a malefic, Saturn, is assigned to the first bound, as expected. Why Saturn is selected rather than Mars is assigned to the first bound is not known at this time.

**Virgo (♍):** As with Taurus and Gemini, only rule #3 applies and the result is the same: Saturn is assigned to the 4<sup>th</sup> bound. The consistency with which this rule works is impressive.

**Libra (♎):** As with Cancer and Leo, only rule #2 applies and a malefic, Saturn, which is exalted in Libra, is assigned to the first bound as expected.

**Scorpio (♏):** As with Cancer, Leo, and Libra, only rule #2 applies and a malefic, Mars, which rules Scorpio, is assigned to the first bound as expected.

**Sagittarius (♐):** The fourth rule applies. There are holes in the first and third pairs so both the first and fourth bounds are malefic. To break the tie (i.e. whether the first or fourth bound is malefic) the ruling planet of Sagittarius, Jupiter, is assigned the first bound. In accordance with rule #3 the doubly malefic fourth bound is assigned Saturn.

**Capricorn (♑):** Rule #3 applies, the fourth bound is doubly malefic and a malefic is assigned to the fourth bound. Interestingly, Mars is assigned as the planet of the fourth malefic, perhaps because Mars is exalted in Capricorn.

**Aquarius (♒):** As with Sagittarius, rule # 4 applies. There are holes in the first and third pairs, which means that both the first and fourth bounds are malefic. The tie is resolved by assigning the ruler of Aquarius, Saturn, to the first bound. Again our rules work perfectly. As a side note, interestingly Jupiter is assigned to the fourth term and there may be some undiscovered rule for determining how other planets are assigned to bounds.

**Pisces (♓):** None of our four rules for assigning malefic planets apply so the last two bounds are assigned to the natural planets: Mars for the fourth bound and Saturn for the fifth bound.

## Conclusions

Four hypothetical rules determine how malefic planets are assigned to the Ptolemaic Hellenistic bounds. The consistency with which the rules work is impressive. Further analysis of the arrangement of the planets assigned to terms might reveal more details of how planets are assigned to bounds. At this point there is no way to determine if the hypothetical basis of terms is correct but the consistency with which the rules work is remarkable. If more rules are found to build upon these and identify how other planets are assigned to terms, this would add increasing evidence that the hypothesis is correct.

## References

1. See for example, the history of the zodiac at [http://en.wikipedia.org/wiki/Zodiac#Early\\_history](http://en.wikipedia.org/wiki/Zodiac#Early_history)
2. Frawley, David. *The Rig Veda: And the History of India*, 2003, Publisher: Aditya Prakashan, New Delhi, India
3. Maternus, Firmicus. *Mathesis*, circa 335 AD.
4. <http://www.leelehman.com/pages/images/Dignity.pdf>

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