

Plato's Number

————— 216 —————

The Nuptial Number, the 120-Cell, and the Cosmic Clock

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Part of The Cosmic Clock series

The Riddle

In Book VIII of the *Republic* (546b–d), Plato describes a mysterious number through the voice of the Muses. This number, he claims, governs the cycles of human fertility and the decline of the ideal city-state. When rulers fail to align births with this number, the perfect city degenerates into tyranny.

The passage is the most notorious puzzle in Western philosophy. Schleiermacher stopped translating the *Republic* for twelve years trying to decode it. Cicero called it simply 'obscure.' A French translator in 1762 gave up entirely, substituting the words: *whose mystery it is useless to explain to you because it is beyond your understanding.*

And yet Aristotle, writing within a generation of Plato, treated it as perfectly obvious, summarising it in the *Politics* (V.12.8) as:

“A base of numbers in the ratio of 4:3 and this when combined with a figure of five gives two harmonies: he means when the number of this figure becomes solid.” — Aristotle

Three candidate values have dominated 2,400 years of scholarly debate: **216**, **3,600**, and **12,960,000**. Scholars have argued over which is 'correct.' The framework proposed here suggests they are not in competition. They are the same number at different levels of a single hierarchy — and that hierarchy is the temporal structure of the 120-cell.

The Passage

The critical text, known as the 'Speech of the Muses,' reads in the Loeb Classical Library translation:

“The divine race has a cycle comprehended by a perfect number, but the number of the human race's cycle is the first in which root and square increases, forming three intervals and four terms of elements that make like and unlike and wax and wane, show all things agreeable and rational towards one another.” — Republic VIII, 546b–d

The passage continues with references to 'rational and irrational diameters,' numbers whose sides produce 4,800 and 2,700, whose product is 12,960,000 — described as $3,600^2$, generating 'two harmonies.'

The context is crucial. Socrates invokes the Muses to deliver this number, framing it as divine knowledge: the Muses are *playing with us and teasing us like one child teases another*. The tone signals deliberate encoding —

knowledge hidden in plain sight, for those with the key to read it.

The Three Candidates

Candidate 1: 216

The most frequently proposed value. Its mathematical properties are remarkable:

$$216 = 6^3 = 3^3 + 4^3 + 5^3$$

It is simultaneously the cube of 6 (the first perfect number, and the 'marriage number' = 2×3) and the sum of cubes of the Pythagorean triple 3–4–5. This is the only number with both properties. The Pythagoreans called 6 the 'nuptial number' because it is the product of the first female number (2) and the first male number (3). Its cube, 216, is therefore the 'solid' or three-dimensional expression of marriage — hence Plato's title: the nuptial number.

This matches Aristotle's summary precisely: a base in the ratio **4:3** (the Pythagorean triple's shorter legs), combined with a figure of **5** (the hypotenuse), yielding harmonies **when the figure becomes solid** (i.e. when the relationship is cubed rather than squared).

Candidate 2: 3,600

$$3,600 = 60^2 = 36 \times 100$$

The square of 60 — Base-60 raised to the second power. In Babylonian mathematics, this was the *sar*, the 'great unit.' It is also 36×100 , where 36 is the Clifford rotation angle of the 120-cell. In modern time-keeping (inherited from Babylonian sexagesimal arithmetic), 3,600 is the number of seconds in one hour.

Candidate 3: 12,960,000

$$12,960,000 = 3,600^2 = 60^4 = 4,800 \times 2,700$$

The 'entire geometrical number,' on which there is the widest scholarly consensus. It is Base-60 raised to the fourth power. The 'two harmonies' described in the passage are the factors 4,800 and 2,700, whose ratio is $(4/3)^2$ — the musical fourth (*diatessaron*) squared, the fundamental consonance of Pythagorean music theory.

Their sum is also significant: $4,800 + 2,700 = 7,500$, and $7,500 \div 60 = 125 = 5^3$. There is the 'figure of five becoming solid' that Aristotle described.

The Babylonian Connection

George Barton argued in 1908 (*Journal of the American Oriental Society*) for a Babylonian origin of Plato's number. The connection is straightforward: Babylon used Base-60 arithmetic, and all three candidates are powers or derivatives of 60:

Power	Value	Babylonian	Candidate?
60^1	60	<i>sošš</i>	—
60^2	3,600	<i>sar</i>	Candidate 2
60^3	216,000	—	(216 × 1,000)
60^4	12,960,000	—	Candidate 3

And 216 itself, while not a clean power of 60, is 6^3 — where $6 = 60/10$. Plato studied in Egypt for thirteen years under the Horite priest Sechnuphis, and was deeply influenced by Pythagorean mathematics, which itself drew heavily on Babylonian number theory transmitted through Mesopotamian scribal traditions. The 'Speech of the Muses' is framed as divine revelation — ancient knowledge channelled through the gods.

A 2009 study by Richard Dumbrill (*Four Mathematical Texts from the Temple Library of Nippur*) traced direct Babylonian source material for Plato's construction, strengthening the case that the nuptial number encodes sexagesimal astronomical knowledge.

The Framework Reading

The Cosmic Clock framework proposes that reality is structured by a single toroidal consciousness-EM field whose geometry is the 120-cell — a four-dimensional polytope consisting of 120 dodecahedral cells. Time is the sequential experience of the 120-cell's Clifford rotation, and all astronomical cycles are projections of this rotation at different scales.

In this framework, the three candidate values for Plato's number are not competing interpretations. They are three levels of the same hierarchy:

216 = The Cell Duration

$$25,920 \div 120 = 216$$

The Great Year (25,920 years of precession) divided by the 120 cells of the 120-cell gives 216 years — the fundamental temporal unit of the cosmic clock. One cell-duration. One 'tick.'

In the framework's established decompositions:

Factorisation	Framework terms	Meaning
6×36	$6 \times$ Clifford angle	Hexagonal rotation
12×18	Hopf rings \times Saros	Eclipse geometry
$2^3 \times 3^3$	Weaving ³ \times Loom ³	Cubed algorithms
$216 \times 2 = 432$	Sacred frequency (Hz)	Sound-time bridge
$216 \times 4 = 864$	Day-Year unifier	86,400 sec/day \leftrightarrow 864 pentads

The number 216 is the framework's generative constant. Plato called it the 'nuptial' number because it governs births — and in the framework, each 216-year cell-duration is precisely that: a birth, a new cell entering the experiential sequence. When births fall out of synchrony with this cycle, the city (or civilisation, or soul) degenerates. This is not metaphor. It is the framework's claim about how temporal structure works.

3,600 = Base-60 Squared

The framework identifies Base-60 as a Loom output — the natural counting base of the field's geometry. $3,600 = 60^2$ is the second power of this base, and it connects 216 to the larger structure:

$$216 \times 3,600 = 777,600 = 25,920 \times 30$$

The cell duration multiplied by Base-60 squared equals the Great Year multiplied by the structural month (30 days). The Babylonian *sar* of 3,600 is not an arbitrary large unit — it is the square of the field's counting base.

12,960,000 = Base-60 to the Fourth

The 'entire geometrical number' is 60^4 . Its framework decompositions are striking:

Division	Result	Framework meaning
$12,960,000 \div 25,920$	500	500 Great Years
$12,960,000 \div 216$	60,000	60,000 cell durations
$12,960,000 \div 120$	108,000	Pentagon angle \times 1,000
$12,960,000 \div 360$	36,000	Clifford angle \times 1,000
$12,960,000 \div 864$	15,000	15,000 day-year unifiers
$12,960,000 \div 432$	30,000	30,000 sacred frequencies

The division by 120 is particularly significant. $12,960,000 \div 120 = \mathbf{108,000}$ — the interior angle of the regular pentagon (108°) multiplied by 1,000. This same number emerges independently in the Cosmic Clock's atomic time analysis, where the framework frequency (9,331,200,000 Hz) divided by seconds per day (86,400) also

yields exactly 108,000. Two completely independent routes to the same number: one through Plato's 2,400-year-old riddle divided by the cells of the 120-cell, the other through modern atomic frequency analysis and the structure of the day.

The 3-4-5 Triple as Framework Architecture

Aristotle's summary of Plato's construction is: 'a base in the ratio 4:3, combined with a figure of 5, giving two harmonies when the figure becomes solid.' In the framework, these three numbers are not arbitrary:

Number	Framework identity	Sequence	Role
3	L(2) — Lucas number	The Loom	Structural triad
4	L(3) — Lucas number	The Loom	Hopf fibrations
5	F(5) — Fibonacci number	The Weaving	Pentagon sides

The ratio $4:3 = L(3):L(2)$ is the ratio of Hopf fibrations to Loom triads — the topological-to-structural ratio of the 120-cell. This is also the musical fourth (*diatessaron*), the most fundamental consonance in Pythagorean tuning. The two harmonies of the geometrical number (4,800 and 2,700) stand in the ratio $(4/3)^2$ — the musical fourth squared.

The number 5 is the pentagon — the face of the dodecahedron, the cell of the 120-cell. It is a Weaving (Fibonacci) number, distinct from the Loom (Lucas) numbers 3 and 4. Plato's construction thus encodes the interaction of both framework algorithms: the Loom provides the structural ratios (3 and 4), the Weaving provides the geometric figure (5), and their combination 'becoming solid' (cubed) produces 216.

The phrase '**three intervals and four terms**' maps directly onto the 120-cell's rotation structure: three Clifford rotation intervals (each advancing 36° in two orthogonal planes) and four terms corresponding to the four families of Hopf fibres that decompose the 3-sphere.

The Two Harmonies

The 'two harmonies' of Plato's geometrical number are 4,800 and 2,700, whose product is 12,960,000 and whose ratio is $(4/3)^2 = 16/9$. Their arithmetic reveals further framework structure:

Sum: $4,800 + 2,700 = 7,500$. And $7,500 \div 60 = 125 = 5^3$ — the 'figure of five' having 'become solid.'

Product: $4,800 \times 2,700 = 12,960,000 = 60^4 = (\text{Base-60})^4$.

Ratio: $4,800 / 2,700 = 16/9 = (4/3)^2 = (L(3)/L(2))^2$ — the Hopf-to-Loom ratio squared.

The two harmonies thus encode: the interaction of the Loom ratio (4/3), the Weaving's pentagonal geometry (5^3), and the field's counting base (60^4). They are not arbitrary factors of a large number. They are the framework's two fundamental algorithms expressed as a Pythagorean musical relationship.

Plato's Numbers Across the Dialogues

The *Republic* passage does not stand alone. Plato uses framework-resonant numbers throughout his works:

Timaeus (39d): The 'perfect year' — the period when all celestial bodies return to the same configuration — is widely interpreted as the Great Year of precession: 25,920 years. In the framework: $25,920 \div 216 = 120$, the cells of the 120-cell. The 'perfect number for divine begettings' mentioned at the start of the *Republic* passage is taken to reference this same period.

Laws (737e–738a): The ideal city has 5,040 citizens. This is $7!$ (7 factorial = $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$) and has 59 proper divisors, including every number from 1 to 12 except 11. Plato explicitly notes this extraordinary divisibility as the reason for the choice. In the framework: $5,040 \div 120 = 42$, and $5,040 \div 7 = 720 = 6!$, connecting factorial structure to the 120-cell.

Republic (587d–588a): The 'Allegory of the Allegory' — Plato states the tyrant's life is 729 times less pleasant than the philosopher's, where $729 = 3^6 = 27^2$. The cube $27 = 3^3$ is one factor of 216 ($= 8 \times 27$), and $729 = 216 \times 3.375 = 216 \times (3/2)^3$ — the cell duration scaled by the Pythagorean fifth, cubed.

The pattern is consistent: Plato's chosen numbers decompose through factors of 2, 3, 5, 6, 12, 36, 60, 120, and 360 — the same structural constants that the Cosmic Clock identifies as projections of the 120-cell.

The Context: Cycles of Decline

The nuptial number appears at a specific moment in the *Republic*: the transition from the ideal city to its first stage of corruption. Socrates explains that even the perfect state must eventually decline, because 'for everything that is born there is also a time of destruction.' The mechanism of decline is that rulers will eventually fail to time births correctly, producing children 'out of season.'

In the framework, this is not metaphor. If civilisational and generational cycles are synchronised to the 216-year cell duration, then institutions, knowledge-systems, and cultural coherence would exhibit natural periods of flourishing and decay keyed to this rhythm. The 'rulers' who fail to observe the cycle are those who lose awareness of the temporal structure — who, in the framework's terms, forget that time has geometry.

The passage is also explicitly about **the relationship between divine and human cycles**. The 'perfect number for divine begettings' (25,920 — the Great Year) governs cosmic processes. The nuptial number (216) governs human ones. Their relationship — $25,920/216 = 120$ — is the 120-cell itself: the bridge between divine geometry and human experience.

Why the Passage Was Made Obscure

Plato did not write obscurely by accident. The Muses are described as 'playing with us and teasing us.' The passage has exactly the character of a deliberately encoded text — comprehensible to those with the Pythagorean-Babylonian mathematical training that Plato's inner circle shared, but opaque to those without it.

Aristotle's casual summary confirms this: within Plato's school, the meaning was clear enough to summarise in a sentence. It was only later — after the severing of the Pythagorean oral tradition, the loss of Babylonian sexagesimal fluency, and the shift to Base-10 thinking — that the passage became impenetrable. By the Neoplatonist era (five centuries later), it was already an enigma. By the Renaissance, scholars were spending decades on it.

The framework suggests that what was lost was not a decryption method but a *worldview*: the understanding that time has geometric structure, that Base-60 encodes natural constants, and that numbers like 216, 360, and 25,920 are not convenient approximations but exact expressions of the field's architecture. Without that worldview, the numbers are just numbers. With it, the passage is precise.

Summary

Plato's 'obscure' number is not obscure. It is:

$216 = 25,920 \div 120 = \text{Great Year} \div 120\text{-cell} = \text{the cell duration.}$

The 'two harmonies' ($12,960,000 = 3,600^2 = 60^4$) are Base-60 to the fourth power, encoding the field's counting base in its complete expression.

The 'perfect number for divine begettings' (25,920) is the Great Year — precession — which Plato describes separately in the *Timaeus* as the 'perfect year.'

The 3–4–5 construction is L(2)–L(3)–F(5): the Loom and the Weaving meeting in the Pythagorean triple, becoming 'solid' (cubed) to produce the cell duration.

The Muses were not being obscure. They were being precise. We simply lost the key.

This document is part of The Cosmic Clock For the full framework see: The Cosmic Clock Part VI (Expanded)