# Egyptian Genesis: "Music, millions times music"[1]

Ernest G. McClain

With a touch of genius, or perhaps only common sense, Ian Driscoll and Matthew Kurtz pursue Atlantis where Plato built it—in Greek imagination credited to Egyptian influence. The art of Egypt—carved in stone for eternity--enthralls us still as well as any song Plato knew as "a spell for souls." The sky goddess was shown arched over the earth from fingers to toes, her body sprinkled with the five limbs of *humanoid* ✶ stars that map five congenial *pentatonic* (5-tone) modes. The double glyph for heaven itself was a star surrounded by the circle of the sun ⊙. Stand facing the symbol as if it were deity itself and sing the pattern rising or falling from any tone you please, and continue as far as you are comfortable.

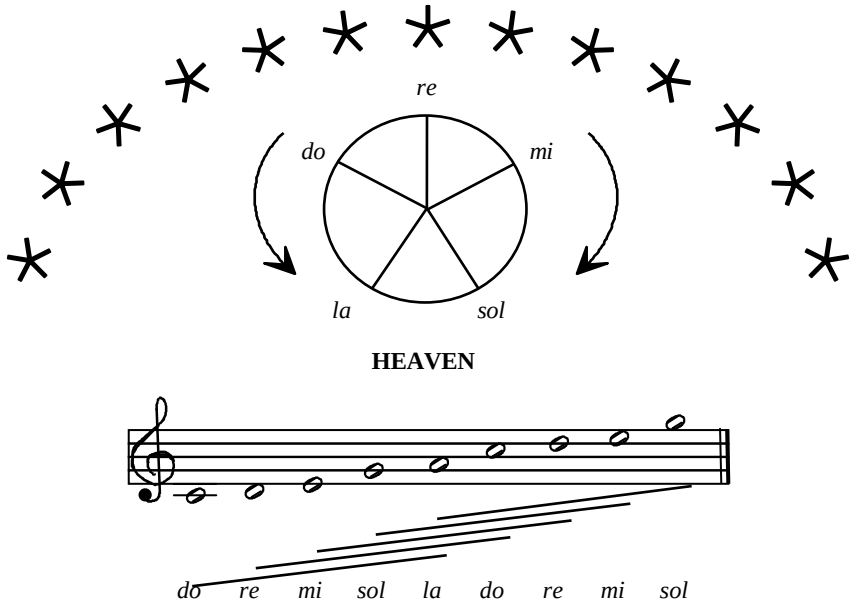



Figure 1

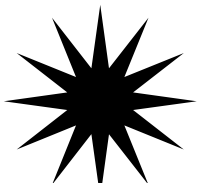
sing any of five modes up or down (right or left)
patterns repeat on the sixth tone

Rotate this page to prove to your eyes that five different patterns are encoded, for if you sing beyond them, repeating cyclically on every sixth tone, your ears will tell you they become one happy, extended pentatonic family. We are in Egypt's heaven and among the stars in Plato's. Here is the self-discipline toward which Zeus hoped that Atlantis—threatening all of Europe and Asia with its aggrandizement--might be turned. He never had to describe the flood, for many others had written that story. CRITIAS stands finished, as it is, halting in mid-sentence while Zeus considers his options …

Figure 2

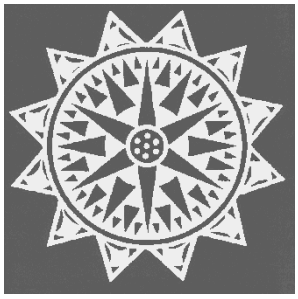
We study Atlantis anew to see what Zeus thought the options were for a political philosophy developed "as argument mixed with music." The main problem, Plato thought, was in Zeus himself, and not in the founding of Atlantis, as I mistakenly assumed four decades ago. Homer had given the Greeks a troubled pantheon in which the male leader's spontaneity, particularly in "The Most Beautiful Meeting" with women, whether divine or human (to use the gracious metaphor of EDFU), was the worst possible example for mankind. Notice that Poseidon is sufficiently restrained for the birth of five pairs of twin sons from the same woman. Zeus is a foreign god. imported into Greece from somewhere further East, and his own birth as a son of Kronos ('Time') had been delayed by that grim tyrant's habit of swallowing his own

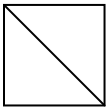
male sons out of fear that one might displace him someday. And that's what happened, naturally. Zeus had been brought to birth by a trick of his mother's, and when he found a chance he severed the paternal genitals to secure his own position, as Kronos had done before him. (Remember that for Pythagoreans the first example of anything becomes the 'algebraic' model (i.e., pattern) for all the replications that follow, as we all tend to assume anyway, and Plato's deity never makes more than one of anything. (The second example proves he got the first one right. This assumption can get anybody else into trouble, and you have a right to be nervous about it.) Plato assumes that time can reverse instantly under alternate reigns of Zeus and Kronos, as two examples in a row illustrate. But neither Egypt nor Plato had any quarrel with time, and I hasten to offer a counter-model here as far more appropriate to understanding the Driscoll/Kurtz view of Egyptian Genesis.



The 12 sharply-pointed teeth in Figure 3 each holds a lotus blossom pointing to the left except that one is turned oppositely at about 5:30 in the local cosmic clock to face its neighbor at about 6:30 as seventh—clearly focusing on the problematic square root of 2 at 6:00 o'clock, essential to 12-tone symmetry when the "zero hour" is 12:00. Telling time from your own shadow was about the only math needed in ancient Egypt, and it gave you a pretty good hint. We merely assume that viewpoint is intended to be "from the throne of heaven" (with Er in Plato's REPUBLIC and Isaiah in the Bible), lying "above the circle of the earth," and count to the right with the local clock as if the other eleven lotuses opened in the wrong direction. This merely means that in our northern hemisphere the sun—who "sees everything" according to the ancients-- *appears* to move to the left, and this confuses a lot of people. Socrates had made this locus at 6:00 (directly below Plato's "zero hour" of 12:00) at the bottom of a vertical diameter (always in motion, of course) the subject of his dialogue with a slave boy in THEAETETUS by proving that the uneducated lad's soul--descended directly from heaven--already could intuit that doubling the area of a square happens on the square of its diameter.[2] (This was the admissions test for his Academy.) The cyclic octave 2:1 is "a sort of identity" in Pythagorean musicology so that its *proportional half* is defined by the square root of 2-- not yet recognized as a "number" in Plato's Greece in the 4th century BCE.[3] The 'pseudo-identity' of halving and doubling introduces a musical "trick" (or rather many tricks) into arithmetic that permit astonishing short-cuts for the initiated, but reduces others to wonder, and sometimes fury.

Figure 3





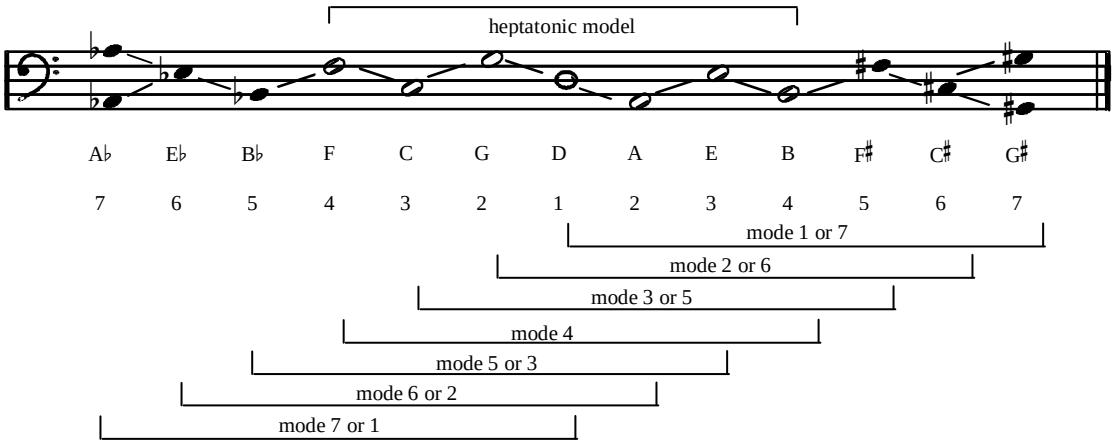
The image in Figure 3 is a Persian relic from the ruins of a city built by descendants of Genghis Khan c. 1300 CE and conveys the right feeling for Egyptian pride in its very long history—prospering always from the annual retreating flood waters of the Nile that would have discouraged a less clever people from building there. The country had made a virtue of its 'timely' disaster, transforming it into a blessing. The seven smallest circles in the very middle (on the hub or axle of the wheel) are the ancient Sumerian symbol for 7 as imprinted in damp clay with the round end of a reed stylus. The six largest triangles emanating from the hub lie on three diagonals terminating in "valleys" between the teeth—conveniently locating six alternate wholetones lying between 'peaks and valleys' in the gears, and thus identifying the angular positions of 12 equal *chromatic* semitones. Twelve middle size arrows divide the model octave 2:1 into 24 quartertones, while 24 smallest triangles further subdivide it into 48 'commas' within which we 'lose our bearings.' (We can identify "a comma" under laboratory conditions, but only rarely in performance.) The "wheel" sums, by counting, as much arithmetic as a musician ever really needs for a *ritual musicology* day or night. The comma is about a quarter of a semitone and thus coincides with the quarter hour as minimal period required to identify the movement of a planet in naked eye astronomy. "Perfect" agreement is always coincidence, discovered in nature when the term is used broadly to include our observation. The 12 lotus blossoms testify to a "Beautiful Meeting" in somebody's soul, whether East or West. "Vector analysis" as "mantles of radiance" for the sun god could not have been simpler in any civilization after the fourth millennium BCE. Observatories of any kind anywhere are part of the game as long as sun and moon continue their habits and somebody is around to notice them. Symbolically they are the right and left eyes of Egypt's guardian falcon, if you don't mind being called a 'mystic.' (*Lover* seems more accurate.) What could be more beautiful to teach a child about his inheritance? But Platonic "social science" is studied within a wider context of *twelves*.

## "What twelve ***is***" in harmonic mythology

Not until Kilmer, Crocker and Brown published the decoding (by an international team of musicologists) of Old Babylonian tuning theory (1900-1600 BCE) in 1976 did we learn that "12" was based on an intensive study of ***thirteen,*** grouped in successive heptatonic (7-tone subsets) in agreement with our naming letters today, but ***in tuning order rather than in Greek scale order!***[4]

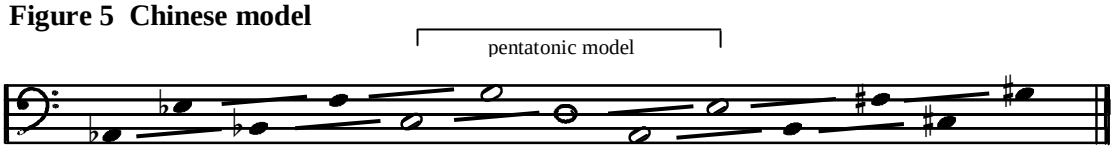
**"Sounds From Silence"--tuning theory 1900-1600 BCE**

Figure 4

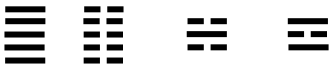


The Egyptian heaven had to have been discovered *within* the great "spiral" of twelve consecutive musical *fifths* of 2:3--alternating with fourths of 3:4--before any part of it really could be understood very deeply.[5] China had done it more simply, perhaps about the same time, in the Shang dynasty, and without. a word of explanation. Notice how the slanting lines connect the tones here.

**Figure 5 Chinese model**




Rising fifths alternate with falling fourths from left to right, and *intervals* reverse from right to left. Count them to discover that 1-3-5-7-9-11 are six odd-numbered "males" defining a wholetone scale. Count them again to confirm that 2-4-6 and 8-10-12 also rise (or fall) by wholetones as "female" even numbers (significant only for keeping results compressed for our convenience).[6] And then applaud the *trigrams* and *hexagrams* of the *I CHING* for silently picturing the result with six solid lines and/or six broken lines (as "male + female"), especially if you have a prurient interest in the sex of numbers, and Plato's Academy was obsessed with nothing else. (Philosophy was essentially a 'cover".) Thus 8x8 = 64 Chinese symbols save a lot of Greek verbal explanation, and encourage adventure, and Egypt loved *economy.* How else could massive temples to the gods seemed appropriately large enough? Egypt was blessed by its floods.



The *TAO TÊ CHING* makes the arithmetic even easier. Chinese common sense, this time directly from the first verse of the 42nd chapter of the TAO TE CHING, preserves sanity and calms the soul while hiding its own far greater genius to be unveiled later.

The Way begot one,
And the one, two;
Then the two begot three
And three, all else.

These few words capture the essence of a pentatonic tuning descending from about 700 BCE and assumed to be inherited from far earlier Shang times. Its algorithm for the pentatonic scale begins, "Take 3 four times," as if 3x3x3x3 = 81 is all you need to do. But there is a verbal "boomerang" in its second part. Assuming now that we are smart enough to reverse direction *boustrophedon* ("as the ox ploughs") 🡐 🡒, at the end of a furrow, the instruction finishes even more cryptically: "add or subtract one-third." Study Table 1 to notice that we can do this in five different ways to define our five different pentatonic modes by the largest ***necessary*** *integers* (81, 96, 108, 128, 144.) Nothing more need be said. The trick lies in the "bull" of 81 that needs to be corralled for four other modes.

**Pentatonic (5-tone) development**

"Take 3 four times" to begin

| sow 'seeds" | 1 | 3 | 9 | 27 | 81 |
|---|---|---|---|---|---|
| gestate 🡐 | 64 | 48 | 72 | 54 | **81** |
| gestate 🡐 | 64 | 96 | 72 | **108** | 81 |
| gestate 🡐 | 128 | 96 | **144** | 108 | 81 |
| gestate 🡐 | 64 | **96** | 72 | 54 | 81 |
| gestated 🡐 | **128** | 96 | 72 | 108 | 81 |

Read each row 🡐 as "add or subtract one-third"

within an "octave double" defined as 2:1

**Table 1 (Ancient China)**

The ancient Near East achieves exactly the same result with equal simplicity and no need for anything as hard as dividing by 3, eagerly avoided wherever possible in both the kitchen and carpentry shop. Merely set forth 1-3-9-27-81 in the same way, then double every number to the maximum necessary to "corral" the "bull" of 81 in any place you like. Tuning *theory* is an intellectual game for which few musicians, most of them impoverished, have little time. Royal scribes probably had some boring days with nothing better to do.

**Table 2 (Ancient Near East)**

Development from "below"

| | | | | |
|---|---|---|---|---|
| **128** | | | | |
| 64 | | | | |
| 32 | **96** | | | |
| 16 | 48 | **144** | | |
| 8 | 24 | 72 | | |
| 4 | 12 | 36 | **108** | |
| 2 | 6 | 18 | 54 | |
| **1** | **3** | **9** | **27** | **81** |

Double upward ↑ as required to corral 81 as pentatonic "bull"

Halve downward ↓ to recover his "seeds"

But any series of 5 consecutive numbers in this "quadrupling of 3" itself (a "continued geometric progression" to Plato, and a routine "logarithmic sequence" to ourselves, $3^{0, 1, 2, 3, 4}$ in modern notation), has the same possibilities as any other. And the same methods can be employed to *extend the series to any limit of interest to the mind*, but not without a smile from ear to ear, for there is a secret in the twelve that *must* be computed to be certain of its existence. The trick concerns the root meaning of Heliopolis ("City of the Sun") as "Eight-town," where every night that luminary had to be towed through the underworld back to his rising place in the morning--through twelve dangerous gates guarded by serpents of awesome length—all of them equivalent to the serpentine rise and fall of musical fifths and fourths in any civilization—and we don't know how to track its historical source. Every single statement attributed to Pythagoras turns out to be a teasing lie, and historians of mathematics have turned out to be eager suckers for the bait, including some of the most famous with the least..

The same procedure turns any set of seven consecutive tones into a "tame" heptatonic serpent defining 7 modes corralling a larger "bull" of $3^6 = 729$, essential to Plato as "tyrant" and to Egypt (in Greek eyes only) as tyrannical Pharaoh "in the midst of the Nile." Pharaoh would heard it as a compliment and smiled.

**Table 3 Heptatonic quantification**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1,024 | | | | | | |
| 512 | | | | | | |
| 256 | 768 | | | | | |
| 128 | 384 | 1,152 | | | | |
| 64 | 192 | 576 | | | | |
| 32 | 96 | 288 | 864 | | | |
| 16 | 48 | 144 | 432 | 1,296 | | |
| 8 | 24 | 72 | 216 | 648 | | |
| 4 | 12 | 36 | 108 | 324 | 972 | |
| 2 | 6 | 18 | 54 | 162 | 486 | |
| 1 | 3 | 9 | 27 | 81 | 243 | 729 |

Take 3 six times to define the heptatonic bull of $3^{6.}$ Double upward ↑ to corral in 7 modes. Halve downward ↓ to recover his "seeds."

The Chinese dragon in Figure 3 is the awesome Aphosis of ancient Egypt, secure in the knowledge that he himself is scribally "endless," that certainty being supported now archaeologically, linguistically, and arithmetically by neighboring civilizations. Any pentatonic or heptatonic subset is merely a "tame serpent," *Lion of the ground,* in Mesopotamian metaphor, carved into the stone mountains of Egypt as a sphinx, and reported in the charming story of "The Shipwrecked Sailor" dating to about 1500 BCE, with a kingly serpent anticipating the unflappable and loquacious relative who is reprised three times in the Bible. The serpent confirms to Eve that indeed her God has lied to her about the apple; he tricks YHWH into unconscionable treatment of Job, his own most loyal servant; and he returns in the New Testament to trap Jesus the Savior into a egomantic emphasis on his own importance that is corrected only in his very last breath on the cross, where he finally submits to his destiny. Egyptian and Biblical serpent wins every encounter with man or woman, and their vocabulary and self control is superb..

Scribal exercise c.1800 BCE
Computing exponential increase into billions by doubling and by doubling plus adding

| | | |
|---|---|---|
| 0 | 1 | 1 |
| 1 | 2 | 3 |
| 2 | 4 | 9 |
| 3 | 8 | 27 |
| 4 | 16 | 81 |
| 5 | 32 | 243 |
| 6 | 64 | 729 |
| 7 | 128 | 2,187 |
| 8 | 256 | 6,561 |
| 9 | 512 | 19,683 |
| 10 | 1,024 | 59,049 |
| 11 | 2,048 | 177,147 |
| 12 | 4,096 | **531,441** |
| 13 | 8,192 | 1,594,323 |
| 14 | 16,384 | 4,782,969 |
| 15 | 32,768 | 14,348,907 |
| 16 | 65,536 | 43,046,721 |
| 17 | 131,072 | 129,140,163 |
| 18 | 262,144 | 387,420,489 |
| **19** | **524,288** | 3,486,784,401 |
| 20 | 1,048,576 | |
| 21 | 2,097,152 | |
| 22 | 4,194,304 | |
| 23 | 8,388,608 | |
| 24 | 16,777,216 | |
| 25 | 33,554,432 | |
| 26 | 67,108,864 | |
| 27 | 134,217,728 | |
| 28 | 268,435,456 | |
| 29 | 536,870,912 | |
| 30 | 1,073,741,824 | |

(translated from J. Friberg)[7]

**Table 4**

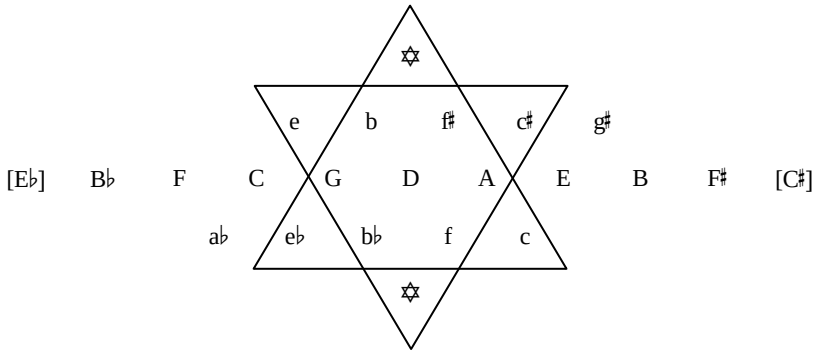
Foundational habits in harmonical mythology

Framing octaves vs 5ths and 4ths

Now a *counting* game begins, and readers must be able to get to 12 on their own because "twin sons" also have a "first pair" notated today with "1" as exponent. This requires the throne (Pharaoh's or YHWH's) to be recognized as the "zero power" of *any* number, including 3. Study this modification of Figure 1 to meet Plato's "five pairs of twin sons" in Atlantis--if only dear little Clito had NOT been specifically "human." The "wings" here belong only to Spiral 5ths, as if "angels from heaven" where they belonged to Plato's planets (until later Alexandrians checked him out and found them in the wrong positions). "Human births" via ratios of 5:4 arise when the Serpent is cut at C and E and the three segments are overlapped vertically along the diagonals / / / / / exposing c-sharp and e-flat (in lower case) on one diagonal and c and e on the other. But the rows above and below lie a comma closer to the middle row of "angels" and rulers, and here the difference is noticed in upper and lower case typeface.

**Plato's harmonic schema for Atlantis**

Figure 6




| Table 5. TRINITARIAN COUNTING ("Twin sons") | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| $3^5$ | $3^4$ | $3^3$ | $3^2$ | $3^1$ | "1" | $3^1$ | $3^2$ | $3^3$ | $3^4$ | $3^5$ |
| Old Babylonian "regularization" of base 60 notation (1900-1600 BCE) as developed in Homer made Plato's unique crystallization in Atlantis the "foundation" of both Christianity and Islam while employing only the most ancient "Egyptian arithmetic," likely profiting from Sumerian/Babylonian insight. Atlantis is interrupted to prevent a sixth pair of "twins" from introducing the "Tyrant" as $3^6$ = 729 expressed as 666 meaning 3 to the $6^{th}$ power. There was no way this normal scribal arithmetic could be "hidden" from the literate scribes of neighboring cultures. | | | | | | | | | | |

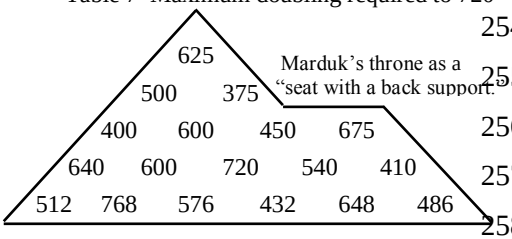
In this matrix alignment counting to six from the throne in either direction leaves five twins in the other to explain the congress of kings in alternate periods of 6 and 5 years, doing equal honor to odd and even. But it also suggests why first-born Jewish sons get a double inheritance of family assets. Here is the revolution in mathematics that Plato fathered by recognizing what had been going on for thousands of years, preparing the way for Descartes and his colleagues 2000 years later (as Neugebauer and Sachs recognized in 1945).[8]

Each increase by 60 adds another pair of twin sons to the central axis of the matrix. But a numerical coincidence allows C-sharp to appear on the right within the limit of $60^4$=12,960,000. The required physical ambidexterity thus allows $3^5$=243 (Abram in Hebrew gematria, until his named is changed to father Isaac) a reciprocal E-flat to complete the maximum symmetry of eleven tones. (Plato favors the Hebrew Magen David *restriction*, with god in the midst of *any* ten "gathered for prayer," and G D A constant (but not C and E). The triangles of the Magen David offer four alternative tunings above and below the central axis as outlined in the "Marriage Allegory" by its factoring into both 3600 squared and 2700x4800. Thus understanding eventually reduces to patterns within the multiplication table for 3x5 "no more than 1,000" for Plato. Table 6 shows fighting men as naked; Table 7 shows all but a few as married (i.e., "doubled in value by a good wife"). (Among the Jews, always "left behind with the baggage train" when fighting threatened.) The study of scribal patterns often requires no doubling whatever.

Table 6 Fighting men as odd and male <1000

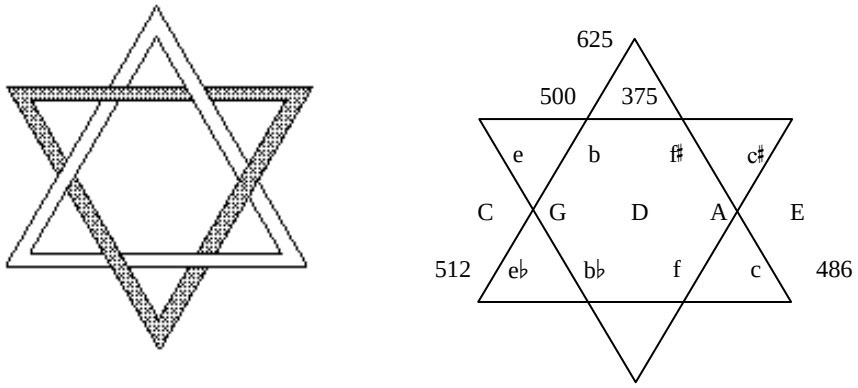
| | | | | | | |
|---|---|---|---|---|---|---|
| | | 625 | | | | |
| | 125 | | 375 | | | |
| 25 | | 75 | | 225 | | 675 |
| 5 | 15 | | 45 | | 135 | 405 |
| 1 | 3 | 9 | | 27 | 81 | 243 | 729 |

Table 7 Maximum doubling required to 720[9]




Interlocked triangles in the Magen David suggest the intricate interweaving of factors of 3 and 5 in the two related systems. Numerical doubling for future *scale order* realigns tones into alternate modes in either pentatonic or heptatonic systems. Rotation of the matrix identifies Plato's "children of worse births" too far from the throne row or lacking reciprocals, eliminating the Hebrew Savior as "Cornerstone." He is saved, indeed, however, by an alternate strategy, so that Plato inadvertently confirms that the Christian Savior is fully human as well as Divine.

Figure 8 HARMONICAL COSMOLOGY




The Savior is "saved" in Greece and in Greek for Christian theology as "888" meaning $8^3$ = 8x8x8 = 512 as the "cornerstone" of Marduk's throne, the "fountain of youth" for Gilgamesh, and as "Osiris enthroned in the Underworld" in Egypt. His reciprocal's naked "musical" identification as fifth in the third row at 3x675 = 2025 would require the throne to be doubled into 1,440 to frame the same "octave womb," the "basic miracle of music."[10] This reduces to 45/32 to equal the Savior—with no gain whatever for the detour into excessively large numbers. I suppress here the intricate foundations of this calculation, easily accessible elsewhere.[11] All ancient cosmology consists of variations on the Egyptian year for which 720:360 is precise only for the Just tonal model so "easily manipulated," as my own advisor in political theory pointed out in a brilliant essay never published.[12]

Greek Apollo, the archer god and kitharist (famed for playing his lyre "upside down" to win a bet with a wind player), is more easily approached first through another Homeric *nom de plume* as *Apollo Smintheus,* "mouse god," displayed in Table 8. Watch how he uses Egyptian arithmetic, first doubling then adding *himself* to reach "3" as many times as he pleases, as if he had read the *TAO TÊ CHING.* Here we goal the way through twelve *intervals* as some anonymous scribe somewhere must have done in the fourth millennium BCE, because several kinds of evidence survive in the Narmer inscriptions as "Scorpion King" at the union of Upper and Lower Egypt dating to about 3200 BCE. Notice Apollo's mincing steps as he munches on a Sumerian "grain pile" that extended to the *next* "double" beyond.

**Table 8. Apollo Smintheus as "mouse god" illustrates how to triple twelve times**

Double downward, then add to itself to identify the next power of "3" and then search for convergence between leading digits in powers of 2 and 3 to discover $2^{19}$ near $3^{12}$

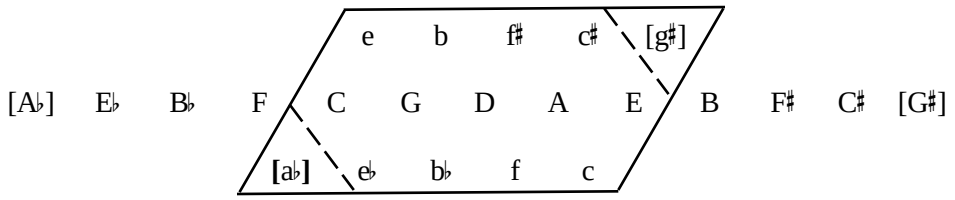
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A♭ | E♭ | B♭ | F | C | G | D | A | E | B | F♯ | C♯ | G♯ |
| $3^0$ | $3^1$ | $3^2$ | $3^3$ | $3^4$ | $3^5$ | $3^6$ | $3^7$ | $3^8$ | $3^9$ | $3^{10}$ | $3^{11}$ | $3^{12}$ |
| 1↓ | 3↓ | 9↓ | 27↓ | 81↓ | 243↓ | 729↓ | 2,187↓ | 6,561↓ | 19,683↓ | 59,049↓ | 177,147↓ | 531,441 |
| 2↗ | 6↗ | 18↗ | 54↗ | 162↗ | 486↗ | 1,458↗ | 4,374↗ | 13,122↗ | 39,366↗ | 118,098↗ | 354,294↗ | [*precession*?] |

The Babylonian tuning system in Figure 4 proceeds through all 13 tones before being presented a second time in reverse order, thus anticipating the *precession* of the equinoxes--a 'turning back' in the behavior of the sun as bluntly cryptic as the ages of Zeus and Kronos reverse for Plato. His favorite example of the forces in play at the turning pole in a chariot race demonstrate vividly the Greek sense of dynamic forces of *physical Necessity* ("Chance," deified for thinkers unfamiliar with the craft) that come into play when "ideal" models are actually "set in motion" as Atlantis was "invented" (inherited?) to display Socrates political models to himself. The musicology may be as old as its celebration in stone circles. The limits of Narmer musicology cannot be confirmed with evidence presently available, but the 400,000 "sheep" whose capture is celebrated more than suffice for 12 tones in theses sequences. And the 120,000 prisoners whose heads he is picture smashing could be the 120,000 Archers, or Hoplites, or Slingers in Plato's Atlantis. And the 1,422,000 goats Narmer captured are certainly Israel's scapegoats for Seth is symbolized by the ratio 64:45 (fifth place in the third row of Figures 7 and 8 when extended by doubling to include him)--meaning 64/45 = 1.422,222 today on our pocket calculators and merely rounded off to the "3 places" preferred by the ancients for "continued fractions."[13] For a hundred years our possession of the Narmer data would have sufficed to support Egyptian precedence if only we could have believed such primitive "animal worshippers" capable of rational thought. We have miss-read history as our own "worst enemies" by our inability to believe that ancestors had "risen from the ape" 40,000 years ago. They chose the animals that made the most perfect images of what they wanted to convey. We don't have to rise again, as some seem to think, unless we regress that far.

## Summary: Apollo as god of music and mathematics

Homeric Apollo could stand on the throne of Egypt at $2^6$=64 and "shoot" accurately and exponentially to either end of this sequence of 12 intervals "between 13 limits" (Plato's description of conditions) by $3^6$, or from one end to the other (and far beyond). Exponential series were no problem and great fun before 3000 BCE. The 13 tones of the complete spiral of 5ths and 4ths is cut in two places (c:C and E:e) to produce alternative *heptatonic* (7-tone) 'Just' systems of 3x5 = 15 pitch classes in which two are at war for each other's position as Osiris and Seth. They are competing for the throne as a-flat and g-sharp in the middle of the octave (the corners of the rhomb). Thus the Horus who reigns as Pharaoh eventually also becomes Osiris at death to reign in the Underworld—the Egyptian heaven of delight-- but never free from Seth's competition (to some authors). The whole system inverts day and night, thus "warfare in heaven" never ceases. And the dead Osiris becomes the living Jesus of the New Testament. There are many ways to tell these stories.

Figure 9




As potential square root of 2 in the precise middle of the octave, a-flat (small case) lies very slightly nearer the throne from *below,* and g-sharp lies very slightly nearer than G-sharp from *above.* Here is the motivation for thousands of years of narrative strife, so subtle that only the arithmetic can illustrate it, and so simple that a child with a pocket calculator can test it in a few seconds. The difference often is aurally trivial, except to the idea of absolute perfection as lying beyond the powers of mankind. Great artists have left tokens of their respect (including the very great self-respect implied by leaving some small portion "unfinished"). In Narmer's palette two very long-necked ambiguous quadrupeds coil their necks around each other as Seth and Horus confront each other eye to eye. The symbolism is brilliant.

The 15 elements of this rhombix constitute the bed of Sumerian Inana (Babylonian Ishtar) as "temple virgin" in Marduk's great temple in Babylon. Tones G and A exchange roles as Poseidon's "first pair of twin sons" (Atlas and Gadirus only because I'm playfully pretending that the Greek *gamma* means G in this notation, while corresponding to C in our alphabet). Chinese history makes "C" its own Huang-Chung 'Yellow Bell' emperor in ancient times, imagined as setting the moral tone for his reign, often notably brief. A and G functions always for Plato (in one way or the other) as his harmonic and arithmetic means, leaving the other tones available as "moveable sounds" for whatever pentatonic and heptatonic alignments we like. They—belonging to the middle row--are indifferent *to rotation by 180 degrees* and thus to 'Poseidon's earthquakes" achieved with reciprocal powers of 5. Atlas acquires "his mother's portion" (perhaps as "first-born" among the Jews, depending on who got his hands on this data first). All other elements that are equidistant from the throne on straight lines through it are *paired twins*. In the neighboring rows of Just ratios above and below their major and minor thirds 'mapped' along diagonals / and \ ) share some "points" of coincidence in the "becoming" of six different major and minor *triads* today. In ancient times it probably was not their roles as "secondary consonances" that made them 'auxiliary guardians,' but more likely that results then were restricted to 3 digits in base 10 arithmetic (instead of 6 digits, as threatened in Table 8, and correspondingly truncated in base 60). At some point in history 'Ishtar' lost her early status "on the throne" (D) as "god 15) to become Venus as both Morning Star and Evening Star, roles formerly belonging to Horus and Seth in Egypt. Plato implies that her new role only recently had been discovered Greece. I notice that her demotion places her in the Savior's favorite manger as "cornerstone," and the book of REVELATION demotes her to oblivion as His light in New Jerusalem, if it ever comes, makes both Sun and Moon superfluous should he ever reappear again. We have much to fear, for at that point time is ended and Babylonian musicology silenced.

The Horus hawk standing guard before EDFU had a twin (now smashed), and representing the "wings" of the tonal cartouche in Spiral 5ths tuning. He is alter-ego of the Great Serpent below and "merely" reciprocates its arithmetic. AS ABOVE, SO BELOW, the rubric of Mesopotamian cosmology, thus fully agreed with the source of all power, but other cultures toyed playfully with the rhetoric and its mathematization (mostly suppressed here). The trapezoidal sides of the towers guarding the entrances to various sections of Egyptian temples are reminders of the geometry useful in taxing quickly and equitably the land refreshed by the annual flooding of the Nile as property lines were restored. All four sides of its pylons lean inward toward the top, and irregular quadratic areas of each side were very simply estimated by squaring half the sum of opposite sides. But perfect "musical solutions" were also readily available when needed by "squaring" some of the corners and computing triangles also with perfect accuracy, as we learned from Neugebuer and Sachs only in 1945. Music was never a separate "science," and physical measurement still proves nothing about *musical values.*

The Argo as the "first 50-oared ship" is not a Greek invention but a new Greek metaphor for a proportion written as 70:50::49:35 but *read in either direction* to identify the 50th unit that straddles the middle of its "octave-double" as one of the greatest miracles among all the arts and sciences. Only the ear has this divine gift of an inner *metric* granted at birth, and that middle unit frames the contest of Horus and Seth. The ratio 49:50 is perfectly centered, and the "sacrifice of the Savior" as the unit between two "robbers" (one 'good' the other 'bad') is the Jewish drama preserving our heritage of *one-percent tolerance*--assuming that our behavior otherwise is appropriately "self-disciplined." Socrates died for this principle. Plato dramatizes it as "What 12 ***is***" in Atlantis by summing its armed forces to 1,200,000. Tones G:D:D:A constitute a Platonic Trinity in the only tunings he requires in philosophy and thus turn inside out to frame A and G as his "twin means" with the octave on D defined by 12:9::8:6 which of course can be read forwards or backwards, and applied to rising or falling pitch classes. The pentatonic scale presented in Figure 1 locates our "feet" at 5 and 7 as musicologically 8 and 9, and permits the perfection of modern equal temperament to be "counted" at intervals of either 5 or 7 hours in either direction, or twinned in both directions, from any place we choose, each option requiring its own appropriate arithmetic. The "dance of the hours" is the only dance there is for a *ritual musicology.*

Inside the entrance pylons to EDFUR we notice that the large public courtyard is lined with 32 pillars, and the unit "1" is "Forgotten Cornerstone" when Table 6 is reconfigured as Table 7, so that $2^5 = 32$ in the basic 60:30 matrix, and doubles further to 888 as $2^9=512$ in Table 8, the Savior's locus in early Christian symbolism. Moses orders 32 virgins from the Jewish victory over the Midianites to be assigned to the high priest's office (Numbers, chapter 31).[14] We might notice also that 675 "sheep" from 675,000 captured are assigned to that office and that Figures 6 and 7 *require* 675 in fourth place in the third row. Also, of 36,000 captured cattle one in fifty go to the Levites in charge of the tabernacle, meaning 36,000/50 = 720, just what we need for the ancient Sumerian "brick constant" (no matter size or shape) and thus also for the 50-year Hebrew Jubilee calendar. We haven't time or space to continue here, But most aspects of Jewish arithmetic seem carefully tested for at least a thousand years in Egypt while the alphabet was being invented. And the geometry of the Magen David itself is splendidly represented in synagogues in a configuration suggesting the interwoven complexity of the arithmetic in Figures 6-7-8. All other matrices for "Holy Mountains" with these three primes are expansions or contraction's of Marduk's throne in Figures 7 and 8, inspired by the same "laws" of harmonic "coincidences" as if God himself had planned them. And the YHWH is a Hebrew plural paying honest credit to his cultural predecessors, slowly perfecting his role.

By inviting us to search for Atlantis at EDFU where the tributes of ten Greek pharaohs suggest they perfectly understood the discipline of Holy Ten-ness (that Plato encrypts into "What twelve ***is***") we may indeed be coming closer to Plato's vision, and to his own reverence for the "body" of the world as well as for its soul. At EDFU The public court stops at a path between twelve magnificent pillars like those painted in the 19th century (see p. 15, looking outward from between them) before the desert sands were swept away for modern visitors. Beyond is another court with 12 smaller pillars, as if mimicking or inspiring Plato's "dyad" (i.e., "two") of "the great and the small." And the darker sanctuary beyond them is surrounded by 13 "chapels" of which 3 are accessible only from neighboring spaces, perhaps accidentally suggesting the 13 tones we had to study to understand the first five.

Table 9
Military strength of Atlantis

| | |
|---|---|
| Archers | 120,000 |
| Hoplites | 120,000 |
| Slingers | 120,000 |
| Javelin throwers | 180,000 |
| Light-armed slingers | 180,000 |
| Horseman and charioteers | 240,000 |
| Sailors | 240,000 |
| Total | 1,200,000 |
| Ships | 1,200 |
| Chariots (1/6th from each ) | 10,000 |

The armed forces of Atlantis total 1,200,000 as Plato playfully reminds us that "what 12 ***is*"** depends on context.[15] Notice 1,200 "ships" and not 10 but 10,000 chariots. He is inventing "political theory" with a "manipulable musical model." All theories come under the rule of *physical "Necessity,"* with whom not even gods may argue.

As an 'archaeomusicologist' of sorts, if allowed so pretentious a title, reviewing "Egyptian Origins" through the eyes of Ian and Matt has been a great experience. I think they've got it right, possibly without really knowing it yet. They are reading Atlantis with what I believe to be "the right feeling." They have learned *reverence for the beautiful*, however mysterious, in their own ways. My own Pythagorean tutors (Siegmund Levarie and Ernst Levy, now both deceased) and I have based our work on that of Albert von Thymus in the late 19th century whose genius in establishing *perspective* was rewarded by the burning of nearly all copies of his work.[16] But notice that across more than 5000 years of written evidence a *theology of music* has never been lost, and is more alive today than ever.[17] "What is not evident from the data presented here is that the Atlantis limit of 12,960,000 as $60^4$ is a Platonic reduction by a factor of 60 from the prevailing Apollo/YHWH matrix of $60^5 = 777{,}600{,}000$ for the highest deity, known to all major civilizations of the ancient Near East during the second millennium BCE.

(It must be understood here that the author is drawing on the recent studies, publications, dialogue and direct assistance of many more colleagues than are indicated in the notes, and in ways that must be acknowledge elsewhere and in detail. Interdisciplinary studies in the modern Academy are highly dependent on personal friendships.)

Table 10 Plato's tonal schema for Atlantis through "4:3 mated with 5" then "thrice increased" to $60^4 = 12,960,000 = 3{,}600^2 = 2{,}700 \times 4{,}800$

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | C♯ | c♯ | c | C | B | b | b♭ | **B♭** | A | G♯ | a♭ |
| D | E♭ | e♭ | e | E | F | f | f♯ | F♯ | G | A♭ | g♯ |
| 4 | **framing fourths of 4:3 are constant within the musical proportion 12:9::8:6 rising or falling** | | | | | | | | 3 | ~ $\sqrt{2}$ | |
| a maximum of two "children of better and worse births" are permitted as "moveable sounds" but no "enharmonic" relatives (sharing the same names) | | | | | | | | | | | |

Here is the schema I've always employed, but never presented clearly. It is easier to understand "holistically" than piecemeal, but that requires experience. You may intuit here why it is not easily intuited from the numbers themselves without careful study of narrative context also. I know of no other presentation quite like this, but many theorists have published and many must be aware of this pattern. (Microtonalists have explored extensively.) Plato's arithmetical total was analyzed correctly by James Adam in the early 1900's, cited by Brumbaugh in the 1950's, and saved me at least 20 years of effort. Chinese description seems simplest, Babylonian is brilliantly applied to tuning practice, and Egyptian relics are charming in their conciseness. In general, "laws" are intended to ensure several degrees of human freedom, but only when severely "self-disciplined." Pentatonic resources of 5x12=60 "mode keys" (specified in China), for instance, require both "perfect pitch" memory and limitation on the number of tones employed and 'rhetorical' emphasis on them or they are perceived as only one "happy family," with little or no modal distinction beween them.

466

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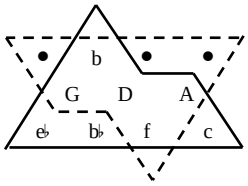
Table 11 Brick alignments to 60-720-2,700- 3,600 -4,800 in Atlantean arithmetic contain 8-18-25-26-27 elements always read with double meanings in base 10, thus escaping the novel notation in base 60.that philosophy avoided. But the matrix is under the contextual discipline of "Necessity" and her daughters, the Fates, always to be feared.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | 3125 | | | | |
| | | 625 | | 1875 | | | |
| | 125 | | 375 | | 1,125 | | 3,375 |
| 25 | | 75 | | 225 | | 675 | | 2,025 |
| | 5 | | 15 | | 45 | | 135 | | 405 | | 1,215 | | 3,645 |
| 1 | | 3 | | 9 | | 27 | | 81 | | 243 | | 729 | | 2,187 |

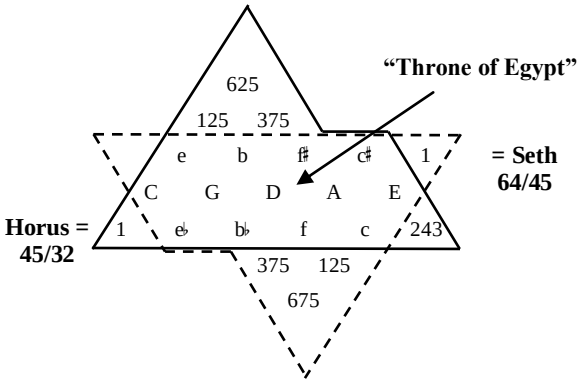
Platonic analysis of Atlantis numerology

Figure A9. Only 8 products of 4x3x5<60 remain from Babylonian Ishtar's position as "god 15"




Egyptian fractions need only a small oval ("opening the mouth"?) to indicate reciprocals (integers as divisors) .

Figure A10. Paired integers <60 or <120 require multiplication to 12x60=720, but 5 results then prove to be "worse births" or without paired twins in the "upright" male matrix-- and including the "cornerstone" unit from which all emanate as multiples.




Only three central rows can produce useful tones. Horus usually wins as smaller integer at the same ratio.

## Epilogue

## The Great Serpent, now deceased?

The upright serpent on the Edenic island in the now popular Middle Egyptian story of "The shipwrecked sailor" is inspiration for the Bible's more loquacious relative some two thousand years later. Driscoll and Kurtz review the story in detail on pages 42 to 48 and include a magical picture of the serpent with sailor prostrate before him on page 45. But in the context of his own time that serpent was a living testament to the influence on Egypt of a Sumerian science in the fourth millennium BCE, two thousand years earlier. It belongs to the foundation of "base 60" arithmetic. All of the 120 sailors assigned the ship were lost except himself, sent as emissary of Pharaoh to "bring back a treasure from the mines"--which of course were Sumerian "holy mountain" matrices of integers 2x3x5<120. This limit of 120 is mentioned several times (as both length of the ship and number of sailors). But this eventually is the lifetime in years assigned to mankind in the Bible and exhibited first by Moses in leading the Jews to liberation between his own 80th and 120th year. In three books and more than forty essays I've never presented this basic matrix. Here 'tis as an example of Plato's "small and great"—indifferent to being read as integers or their reciprocal unit fractions. The pattern inverts naturally within the Magen David but "ejects" 81 as "supernumerary" lacking a reciprocal (i.e., 81 as Pharaoh's agent) within this limit, and also the unit "1" that generates all numbers and thus is "head of the serpent."

Table 12 Man's Lifetime of 120 years

| | | | | |
|---|---|---|---|---|
| | 25 | 75 | | |
| | 5 | 15 | 45 | |
| 1 | 3 | 9 | 27 | 81 |

| | | | | |
|---|---|---|---|---|
| 81 | 27 | 9 | 3 | 1 |
| | 45 | 15 | 5 | |
| | | 75 | 25 | |

Notice the preponderant "harmonical" symmetry under "deity" as generative unit and "head" of the serpent within the "octave double" 120:60. Symmetries are the very heart of the Magen David.

Table 12 Man's Lifetime of 120 years

| | | |
|---|---|---|
| 100 | 75 | |
| 80 | 120 | 90 |
| | 96 | 72 |

| | | |
|---|---|---|
| | b | f♯ |
| G | D | A |
| | b♭ | f |

**Abraham leaves Haran at 75 to pursue a new life exploring the Holy Land under divine guidance. Moses leads 600,000 Jewish brickmakers to freedom between the ages of 80 and 120, but except for Joshua and Caleb only 40,000 from the next generation enter—under "Magen David" discipline, apparently forgotten about 1200 CE during the Diaspora when the musical content of numerical Kabbalism was lost. Preservation of the texts ensures that much of it remains recoverable. Only immortals are able to "return" (as Gilgamesh learned). Thus the Hebrew deity remains "a pillar of fire by night and a dark cloud by day" as he comes and goes while man learns to survive on faith alone as *Jeshurun* ("upright").**

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