Sacred numbers & superstring structural parameters embodied in the five Platonic solids

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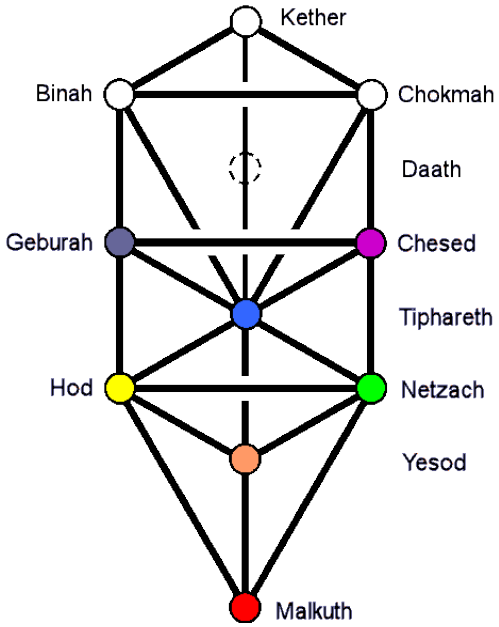
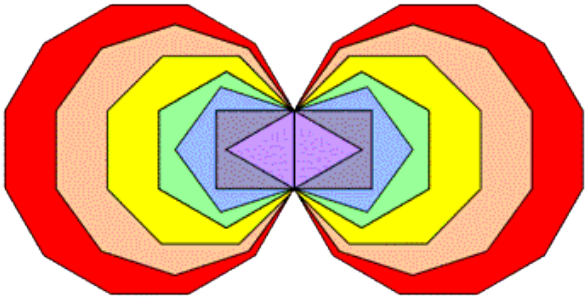
Table of gematria numbers of the 10 Sephiroth in the 4 Worlds

	SEPHIRAH	GODNAME	ARCHANGEL	ORDER OF ANGELS	MUNDANE CHAKRA
1	Kether (Crown) **620**	EHYEH Asher EHYEH (I am that I am) **21, 543**	Metatron (Angel of the Presence) **314**	Chaioth ha Qadesh (Holy Living Creatures) **833**	Rashith ha Gilgalim First Swirlings. (Primum Mobile) **636**
2	Chokmah (Wisdom) **73**	YAHWEH, YAH (The Lord) **26, 15**	Raziel (Herald of the Deity) **248**	Auphanim (Wheels) **187**	Masloth (The Sphere of the Zodiac) **140**
3	Binah (Understanding) **67**	ELOHIM (God in multiplicity) **50**	Tzaphkiel (Contemplation of God) **311**	Aralim (Thrones) **282**	Shabathai Rest. (Saturn) **317**
	Daath (Knowledge) **474**				
4	Chesed (Mercy) **72**	EL (God) **31**	Tzadkiel (Benevolence of God) **62**	Chasmalim (Shining Ones) **428**	Tzadekh Righteousness. (Jupiter) **194**
5	Geburah (Severity) **216**	ELOHA (The Almighty) **36**	Samael (Severity of God) **131**	Seraphim (Fiery Serpents) **630**	Madim Vehement Strength. (Mars) **95**
6	Tiphareth (Beauty) **1081**	YAHWEH ELOHIM (God the Creator) **76**	Michael (Like unto God) **101**	Malachim (Kings) **140**	Shemesh The Solar Light. (Sun) **640**
7	Netzach (Victory) **148**	YAHWEH SABAOTH (Lord of Hosts) **129**	Haniel (Grace of God) **97**	Tarshishim or Elohim **1260**	Nogah Glittering Splendour. (Venus) **64**
8	Hod (Glory) **15**	ELOHIM SABAOTH (God of Hosts) **153**	Raphael (Divine Physician) **311**	Beni Elohim (Sons of God) **112**	Kokab The Stellar Light. (Mercury) **48**
9	Yesod (Foundation) **80**	SHADDAI EL CHAI (Almighty Living God) **49, 363**	Gabriel (Strong Man of God) **246**	Cherubim (The Strong) **272**	Levanah The Lunar Flame. (Moon) **87**
10	Malkuth (Kingdom) **496**	ADONAI MELEKH (The Lord and King) **65, 155**	Sandalphon (Manifest Messiah) **280**	Ashim (Souls of Fire) **351**	Cholem Yesodeth The Breaker of the Foundations. The Elements. (Earth) **168**

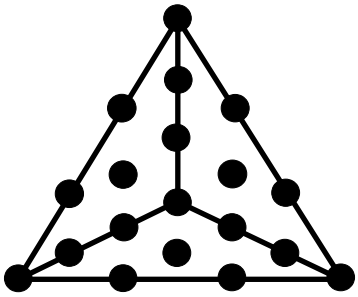
(Any number in this table that appears in the text is written in boldface).



The outer form of the Tree of Life

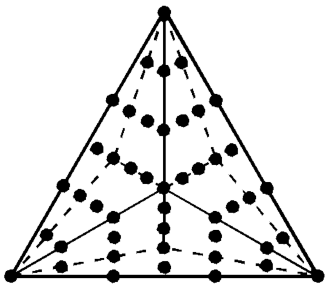


The inner form of the Tree of Life

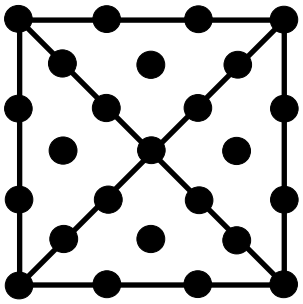


The Type A triangle

A face of the tetrahedron, octahedron & icosahedron

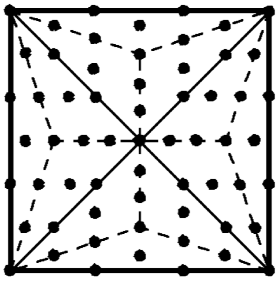


The Type B triangle

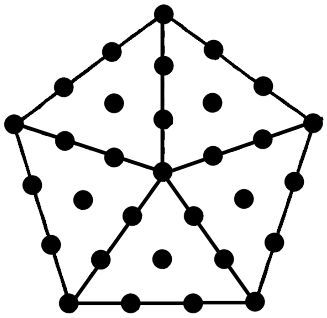


The Type A square

A face of the cube

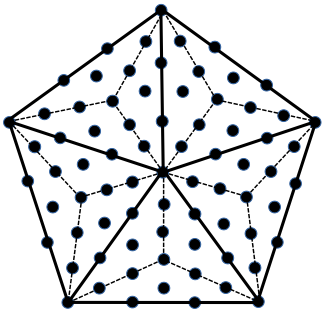


The Type B square



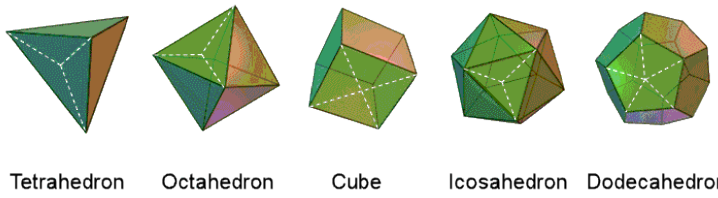
The Type A pentagon

A face of the dodecahedron

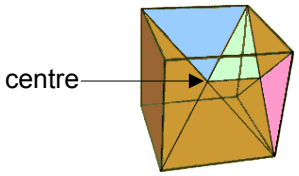


The Type B pentagon

Yod composition of the five Platonic solids



The five Platonic solids have **50** faces divided into 180 sectors.



Pink sector of a face of the cube and internal green and blue triangles whose apices are its centre.

Consider a regular polyhedron with V vertices, E edges and F faces, each face being a regular polygon with m sides. Only five such polyhedra can exist. They are called the five "Platonic solids." Their faces require m to have three possible values: m = 3 (tetrahedron, octahedron & icosahedron), 4 (cube) or 5 (dodecahedron). The formulae derived below apply also to a semi-regular polyhedron with more than one type of edge and whose n types of faces consist of a set of F_i m_i-gons (i = 1, 2, 3,… n), where $F = \sum_n F_i$ and m_i = 3, 4, 5, etc., provided that a term containing "mF" in any formula is replaced by the sum $\sum_n m_i F_i$. All terms involving either E or F do not need modification, even if the polyhedron has more than type of edge or face, because — whatever types they are — every edge is the side of two triangles and every polygonal face has one centre.

Polyhedron with Type A faces & internal triangles

Firstly, we divide every polygonal face into its m sectors (or m_i sectors, if, in the case of a semi-regular polyhedron, it has more than one type of face). Such a sector is exemplified in the diagram above by the pink triangle. Then we join all vertices to the centre of the polyhedron, thereby creating E internal triangles (shown above in the blue triangle) with a polyhedral edge as one of its sides. Lastly, we join all F centres of faces to this centre, thereby creating mF internal triangles (shown by the green triangle). As all polygons in the faces are regarded as Type A, all internal triangles must also be considered as Type A for the sake of consistency. This means that inside every internal triangle are one point, three lines/sides & three triangles as its sectors. Next, we calculate the numbers of points, lines & triangles in all the faces and in all internal triangles. Finally, we turn the triangular sectors of every Type A polygonal face and every internal Type A triangle into tetractyses, and then calculate the numbers of yods (corners & hexagonal yods) in either the faces or the interior of the polyhedron, noting that two hexagonal yods line every side of a tetractys. Use is made of Euler's polyhedral formula:

$$V - E + F = 2.$$

By definition, if two polyhedra are "dual" to each other, one has V vertices and F faces and the other has F vertices and V faces. Their sum: (V+F) is the same for both, and therefore they have the same number of edges because V + F = 2 + E. In the case of the Platonic solids, the octahedron with mF = 3×8 = 24 is dual to the cube with mF = 4×6= 24, whilst the icosahedron with mF = 3×20 = 60 is dual to the dodecahedron with mF = 5×12 = 60, so that, as well as E, mF has the same, respective values for either pair. This means that, as all numbers of geometrical elements or yods can be expressed solely in terms of E and mF (see below), all *corresponding* yod populations are the same for two Platonic solids that are dual to each other.

Faces

Each face is an m-gon with m triangular sectors. The mF sectors of the F faces have E outer sides and mF inner sides meeting at the centres of the F m-gons.
Number of corners ≡ C = V + F = 2 + E.
Number of sides ≡ S = E + mF.
Number of triangles ≡ T = mF.
Number of hexagonal yods ≡ H = 2S + T = 2E + 2mF + mF = 2E + 3mF.
Number of yods ≡ Y = C + H = 2 + 3E + 3mF.

The number "2" denotes (in the case of the octahedron, cube, icosahedron & dodecahedron) two diametrically opposite vertices and (in the case of the tetrahedron) the two vertices at the ends of any edge.

Interior

Each edge and each side of the mF sectors in the F faces are sides of an internal Type A triangle, which has one corner, three sides & three triangles inside it.
Number of corners (excluding the polyhedral centre) ≡ c = E + mF.
Number of sides ≡ s = V + F + 3E + 3mF = 2 + E + 3E + 3mF = 2 + 4E + 3mF.
Number of triangles ≡ t = 3E + 3mF.
Number of hexagonal yods ≡ h = 2s + t = 4 + 8E + 6mF + 3E + 3mF = 4 + 11E + 9mF.
Number of yods (excluding the polyhedral centre) ≡ y = c + h = E + mF + 4 + 11E + 9mF = 4 + 12E + 10mF.

The number "2" denotes the two internal sides passing through the centre that are shared by all internal Type A triangles. The number "4" denotes the four hexagonal yods that line these two sides.

Total number of corners (excluding the polyhedral centre) = C + c = 2 + E + E + mF = 2 + 2E + mF.
Total number of hexagonal yods = H + h = 2E + 3mF + 4 + 11E + 9mF = 4 + 13E + 12mF.
Total number of tetractyses = T + t = mF + 3E + 3mF = 3E + 4mF.
Total number of yods (excluding the centre) = Y + y = 2 + 3E + 3mF + 4 + 12E + 10mF = 6 + **15**E + 13mF.
Number of yods lining sides of tetractyses (excluding the centre) ≡ B = Y + y − (T+t) = 6 + 12E + 9mF.

The number "6" denotes the six yods (two vertices, four hexagonal yods) lining the two internal sides that pass through the centre of the polyhedron and which are shared by all internal Type A triangles: 6 = 2 + 4.

Tabulated below are the numbers of corners, numbers of hexagonal yods and their totals in the Type A faces and Type A internal triangles of each Platonic solid, as well as their complete yod populations.

Yod populations (excluding centres) of the five Platonic solids (Type A)

Platonic solid	Faces			Interior			Total	
	C	H	Y	c	h	y	Y + y	B
Tetrahedron	2+6=8	**48**	2+54=56	18	4+174=178	4+192=196	6+**246**=252	6+180 =186
Octahedron	2+12=14	96	2+108=110	**36**	4+348=352	4+384=388	6+492=498	6+360=366
Cube	2+12=14	96	2+108=110	**36**	4+348=352	4+384=388	6+492=498	6+360=366
Icosahedron	2+30=32	240	2+270=**272**	90	4+870=874	4+960=964	6+1230=1236	6+900=906
Subtotal	8+60=68	480	8+540=548	180	16+1740=1756	16+1920=1936	24+2460=2484	24+1800=1824
Dodecahedron	2+30=32	240	2+270=**272**	90	4+870=874	4+960=964	6+1230=1236	6+900=906
Total	10+90=100	720	10+810=820	270	20+2610=2630	20+2880=2900	30+3690=3720	30+2700=2730

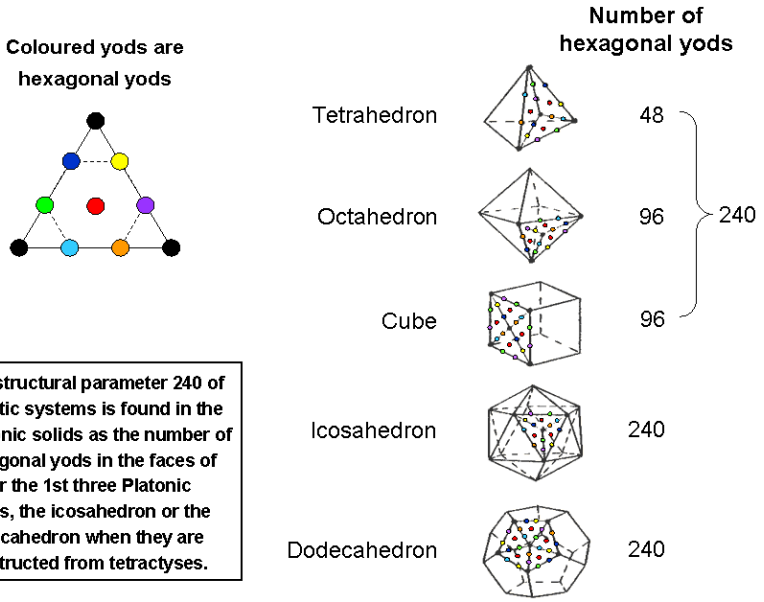
Platonic solid	C + c	H + h
Tetrahedron	2 + 24 = **26**	4 + 222 = 226
Octahedron	2 + **48** = **50**	4 +444 = 448
Cube	2 + **48** = **50**	4 + 444 = 448
Icosahedron	2 + 120 = 122	4 + 1110 = 1114
Subtotal	8 + 240 = **248**	16 + 2220 = 2236
Dodecahedron	2 + 120 = 122	4 + 1110 = 1114
Total	10 + 360 = 370	20 + 3330 = 3350

Comments

- The number of corners of the 180 tetractyses in the **50** faces = 100 = 10^2 = $1^3 + 2^3 + 3^3 + 4^3$.
- **246** yods surround the axis of the tetrahedron, where **246** is the number value of *Gabriel*, the Archangel associated with Yesod. There are **248** yods other than the four hexagonal yods lining its axis. The simplest Platonic solid embodies the dimension **248** of the rank-8 Lie group E_8 appearing in $E_8 \times E_8'$ heterotic superstring theory. This number is the number value of *Raziel* (Herald of the Deity), which is the Archangel associated with this Sephirah. Intuitively speaking, it seems plausible that the four vertices and the four centres of its triangular faces — the points diametrically opposite vertices — are the eight most basic points in the tetrahedron that would correspond to the eight simple roots of E_8, the remaining 240 yods corresponding to its 240 roots. The tetrahedron has 66 tetractyses with **26** corners, where **26** is the number value of YAHWEH, the Godname of Chokmah. 186 yods surround the centre of the tetrahedron, lining the sides of these tetractyses. Including the centre, **187** yods line their sides. This is the number value of *Auphanim*, the Order of Angels associated with Chokmah.
- The number of corners of tetractyses in the first four Platonic solids = 68 + 180 = **248**. They comprise the eight "poles" at the ends of their axes and 240 corners that surround the latter. This compares with the dimension **248** of E_8 (or E_8'). Each corner corresponds to a root. The eight polar vertices correspond to its eight simple roots, and the 240 corners surrounding them correspond to its 240 non-zero roots. The first four Platonic solids embody the dimension of E_8. The tetrahedron and octahedron have **72** corners of triangles that surround their axes, the octahedron having **48** such corners. E_6, the rank-6 exceptional subgroup of E_8, has **72** roots that belong to the 240 roots of E_8, whilst F_4, the rank-4 exceptional subgroup of E_6,has **48** such roots. The **48** corners of the octahedron consist of **36** corners of internal tetractyses and 12 corners of tetractyses in its eight faces (four vertices and eight centres of faces). This compares with the 12 roots of G_2, the rank-2, exceptional subgroup of F_4. On average for the first four Platonic solids, (**248**/4=**62**) corners surround the centre, where **62** is the number value of *Tzadkiel*

(Benevolence of God), the Archangel assigned to Chesed.

- There are 240 hexagonal yods in the 18 faces of the first three Platonic solids and 240 hexagonal yods in the 20 faces of the icosahedron, the fourth Platonic solid:



The structural parameter 240 of holistic systems is found in the Platonic solids as the number of hexagonal yods in the faces of either the 1st three Platonic solids, the icosahedron or the dodecahedron when they are constructed from tetractyses.

The (240+240=480) hexagonal yods in the faces of the first four Platonic solids symbolise the (240+240=480) roots of the heterotic superstring gauge symmetry group $E_8 \times E_8'$.

- The counterparts of this in superstring theory are the 240 non-zero roots of E_8 and the 240 roots of E_8' in $E_8 \times E_8'$ heterotic superstring theory. Alternatively, the icosahedron and its dual, the dodecahedron, each has 240 hexagonal yods in its faces.
- Both the octahedron and the cube contain 498 yods. Starting with two diametrically opposite "North and South poles," there are (498−2=**496**) yods in the 132 tetractyses making up each polyhedron. They both embody the dimension **496** of $E_8 \times E_8'$. The corresponding number for the icosahedron and its dual, the dodecahedron, is 1234, where 1, 2, 3 & 4 denote the numbers of yods in the four rows of the tetractys.
- Surrounding the axes of the first four Platonic solids are 540 yods in the 120 tetractyses making up their faces. This compares with the 540 SLs in CTOL down to the top of the lowest Tree of Life (CTOL is the Cosmic Tree of Life that maps all levels of reality; *see* here). In total, 2460 yods surround their axes.
- There are 990 tetractyses in the faces (180) and interior (810) of the five Platonic solids, where $990 = 10^3 - 10$. In circular geometry, the Nth n-circle is defined as a hexagonal array of similar circles, overlapping centre-to-circumference, with N circles spread along each outermost side of the array. The 1-circle is the single circle, the 2-circle is a circle surrounded by six circles at the corners of a hexagon, etc. The total number of circles in the first N n-circles is N^3 because the N n-circles are successive cross-sections in a diagonal plane of an N×N×N cubic array of spheres, all the N spheres lined on the diagonal of the cubic array appearing as one circle when viewed along it. (N^3-N) circles surround their central circles. Hence, the first 10 n-circles have ($10^3-10=990$) circles surrounding their central circles. The number of tetractyses needed to construct the five Platonic solids is equal to the number of circles that surround the central circles of the first 10 n-circles. Alternatively, as 10^3 is the number of dots in a 10×10×10 cubic array of dots, there are ($10^3-10=990$) dots surrounding an axis that passes through two opposite faces of the cube and is lined by 10 dots, e.g., an edge or diagonal. Each 10×10 square sheet of 99 dots surrounding the axis can be thought to represent an average half of a Platonic solid containing 99 tetractyses.
- The first four Platonic solids contain 660 tetractyses lined by 1824 yods. On average, 456 yods line the sides of 165 tetractyses, so that there are 228 boundary yods on average in each half. Including their polyhedral centres shared by either half of the polyhedron, 229 yods on average line sides in each half. 229 is the **50**th prime number, showing how ELOHIM, the Divine Name assigned to Binah with number value **50**, prescribes the number of yods needed to form the average half of the four Platonic solids believed by the ancient Greeks to be the shapes of the particles of the four Elements.
- There are 548 yods in the 120 tetractyses in the faces of the first four Platonic solids. On average, there are (548/4=137) yods in the 30 tetractyses. This is the number whose reciprocal is the approximate value of the fine-structure constant $\alpha = e^2/\hbar c \approx 1/137.035999177$, which determines the strength of the coupling of the electromagnetic field to electrically charged, subatomic particles like the electron, the sizes of atomic orbitals, etc. Although its magnitude has never been explained in a way that satisfies physicists, its presence in physics is not a mystery. The author has encountered many instances of its function as a defining parameter of sacred geometries, and other examples will be discussed later.
- 2730 yods line the 990 tetractyses in the five Platonic solids. On average, 546 yods line 198 tetractyses, i.e., 542 yods other than the four hexagonal yods lining the central axis. Including the centre, there are **543** boundary yods on average other than these axial yods. This is the number value of EHEIEH

ASHER EHEIEH, ("I am that I am"), the *complete* Godname assigned to Kether, the first Sephirah of the Tree of Life. Including the four hexagonal yods in the axis, 547 yods on average line sides of tetractyses. 547 is the **101**st prime number, where **101** is the **26**th prime number. This remarkable property shows how YAHWEH (יהוה), the Godname of Chokmah with number value **26**, arithmetically prescribes the shapes of all the 198 tetractyses making up, on average, a Platonic solid. Lining the 495 tetractyses in each set of five halves are (2730/2=1365) yods. Including the centres of the five Platonic solids, there are 1370 boundary yods in each set. Remarkably, this is the yod population of the (7+7) enfolded Type B polygons making up the inner form of the Tree of Life (*see* here). The 20 yods (10 corners, 10 hexagonal yods) lining the half-axes of the five Platonic solids have their counterpart in the four yods in the root edge separating the two sets of polygons and the 16 yods of the inner Tree that are shared with the outer Tree of Life, for the former consist of two corners and two hexagonal yods and the latter comprise eight hexagonal yods and eight corners, i.e., the 20 yods that are either shared or in the root edge comprise 10 corners and 10 hexagonal yods — the same as those lining the half-axes in either set of five halves of the Platonic solids. This correspondence shows that each set of five halves of the Platonic solids is the regular polyhedral counterpart of the inner Tree of Life.

- The five Platonic solids contain 990 tetractyses with 370 corners. Surrounding their axes are 360 (= **36**×10) corners, an average of **72** corners for a Platonic solid, where **72** is the number value of Chesed. **36** corners on average surround the half-axis in half a Platonic solid. The number value **36** of ELOHA, the Godname of Geburah, prescribes the number of points defining the basic triangles in each average half. There are (370−**50**=320) corners other than vertices, an average of **64** for a Platonic solid, where **64** is the number value of *Nogah* (Glittering Splendour), the Mundane Chakra of Netzach. On average, half of a Platonic solid contains 32 corners that are not vertices, where 32 is the **31**st integer after 1 and **31** is the number value of EL (God), the Godname of Chesed, which immediately precedes Geburah in the Tree of Life.
- The number of hexagonal yods in the last four Platonic solids is 3108, where

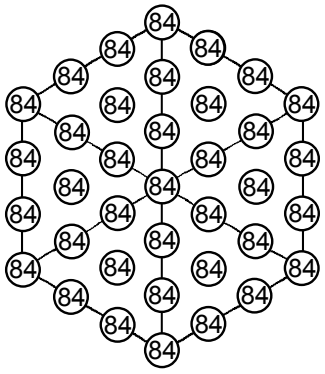
$$3108 = 1^4 + 3^4 + 5^4 + 7^4.$$

This property is an example of the mathematical beauty revealed by the Platonic solids when constructed from tetractyses. The average number of hexagonal yods in them = 3108/4 = 777, where 7 is both the *fourth* odd integer and the *fourth* prime number. All these properties illustrate *par excellence* the author's Tetrad Principle, discussed in his Article 1, available at his website. It is also exemplified by the fact that 777 = **21**×37, where **21** is the number value of EHEIEH, part of the Godname of Kether, so that 3108 = 4×777 = 84×37, where

$$84 = 1^2 + 3^2 + 5^2 + 7^2$$

is the sum of the squares of the first *four* odd integers and 37 is the number of yods in the Type A hexagon, which is the *fourth* type of regular polygon:

3108 =



Type A hexagon

- The number of yods surrounding the axes of the five Platonic solids is 3690. Forty of them are vertices, leaving 3650 yods. On average, a Platonic solid has (3650/5=730=**73**×10) yods other than vertices surrounding its axis, where **73** is the number value of Chokmah. The total number of yods is 3720, of which **50** are vertices and **50** are centres of faces, leaving 3620 yods. Each half of a Platonic solid contains on average 362 yods. Including its centre, each half on average contains **363** yods, where **363** is the number value of SHADDAI EL CHAI (Almighty Living God), the complete Godname of Yesod.

Polyhedron with Type B faces & internal triangles

Faces

Number of corners ≡ C = V + F + mF = 2 + E + mF.
Number of sides ≡ S = E + 4mF.
Number of triangles ≡ T = 3mF.
Number of hexagonal yods ≡ H = 2S + T = 2E + 8mF + 3mF = 2E + 11mF.
Number of yods ≡ Y = C + H = 2 + 3E + 12mF.

The number “2” denotes (in the case of the octahedron, cube, icosahedron & dodecahedron) the two diametrically opposite vertices or (in the case of the tetrahedron), the two vertices at the ends of any edge.

Interior

Number of corners (excluding the polyhedral centre) ≡ c = 4E + 4mF.
Number of sides ≡ s = V + F + 12E + 12mF = 2 + E + 12E + 12mF = 2 + 13E + 12mF.
Number of triangles ≡ t = 9E + 9mF.
Number of hexagonal yods ≡ h = 2s + t = 4 + **26**E + 24mF + 9E + 9mF = 4 + 35E + 33mF.
Number of yods (excluding the centre) ≡ y = c + h = 4E + 4mF + 4 + 35E + 33mF = 4 + 39E + 37mF.

The number “2” denotes the two internal sides passing through the centre that are shared by all internal Type B triangles; the number “4” denotes the four hexagonal yods lining these two sides.

Total number of corners (excluding the centre) = C + c = 2 + E + mF + 4E + 4mF = 2 + 5E + 5mF.
Total number of hexagonal yods = H + h = 2E + 11mF + 4 + 35E + 33mF = 4 + 37E + 44mF.
Total number of tetractyses = T + t = 9E + 12mF.
Total number of yods (excluding the centre) = Y + y = 2 + 3E + 12mF + 4 + 39E + 37mF = 6 + 42E + **49**mF.
Number of yods lining sides of tetractyses (excluding the centre) ≡ B = Y + y − (T+t) = 6 + 33E + 37mF.

Tabulated below are the numbers of corners, numbers of hexagonal yods and their totals in the Type B polygonal faces and internal triangles of each Platonic solid, as well as their complete yod populations.

Yod populations (excluding centres) of the five Platonic solids (Type B)

Platonic solid	Faces			Interior			Total
	C	H	Y	c	h	y	Y + y
Tetrahedron	2+18=20	144	2+162=164	**72**	4+606=610	4+678=682	6+840=846
Octahedron	2+**36**=38	288	2+324=326	144	4+1212=1216	4+1356=1360	6+1680=1686
Cube	2+**36**=38	288	2+324=326	144	4+1212=1216	4+1356=1360	6+1680=1688
Icosahedron	2+90=92	720	2+810=812	360	4+3030=3034	4+3390=3394	6+4200=4206
Subtotal	8+180=188	1440	8+1620=1628	720	16+6060=6076	16+6780=6796	24+8400=8424
Dodecahedron	2+90=92	720	2+810=812	360	4+3030=3034	4+3390=3394	6+4200=4206
Total	10+270=**280**	2160	10+2430=2440	1080	20+9090=9110	20+10170=10190	30+12600=12630

Platonic solid	C + c	H + h	B
Tetrahedron	2 + 90 = 92	4 + 750 = 754	6 + 642 = 648
Octahedron	2 + 180 = 182	4 +1500 = 1504	6 + 1284 = 1290
Cube	2 + 180 = 182	4 + 1500 = 1504	6 + 1284 = 1290
Icosahedron	2 + 450 = 452	4 + 3750 = 3754	6 + 3210 = 3216
Subtotal	8 + 900 = 908	16 + 7500 = 7516	24 + 6420 = 6444
Dodecahedron	2 + 450 = 452	4 + 3750 = 3754	6 + 3210 = 3216
Total	10 + 1350 = 1360	20 + 11250 = 11270	30 + 9630 = 9660

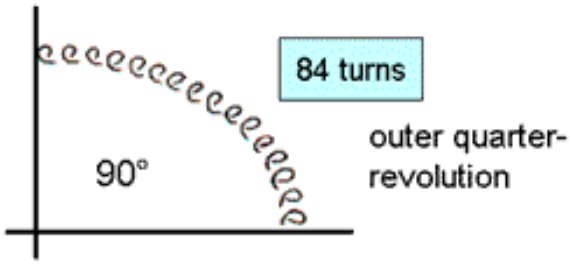
Comments

- The tetrahedron has 92 corners, which is also the number of corners of the 180 tetractyses in the faces of both the icosahedron and dodecahedron. In each half of the tetrahedron are (92/2=46) corners. Including the centre, each half has 47 corners, where 47 is the **15**th prime number. This shows how YAH (יה), the Godname with number value **15** assigned to Chokmah, prescribes the simplest Platonic solid. The tetrahedron consists of four vertices, six edges, four triangular faces & one tetrahedron, i.e., **15** geometrical elements. YAH prescribes its *geometrical* composition as well. It also prescribes the first four Platonic solids because they have 188 corners in their 38 faces, i.e., 47 corners on average. The interior of the tetrahedron has **72** corners, where **72** is the number of Chesed. Including its centre, it has **73** internal centres, where **73** is the number value of Chokmah.
- The 540 tetractyses in the **50** faces of the five Platonic solids have **280** corners, where **280** is the number value of *Sandalphon*, the Archangel of Malkuth. Inside the five polyhedra are 1080 corners, an average of **216**. This is the number value of Geburah, the next Sephirah after Chesed in the Tree of Life. Their total number of corners is 1360, an average of 136 per half-polyhedron. Including the centre, the average half of a Platonic solid contains 137 corners. This number is the 33rd prime number, where

$$33 = 1! + 2! + 3! + 4!.$$

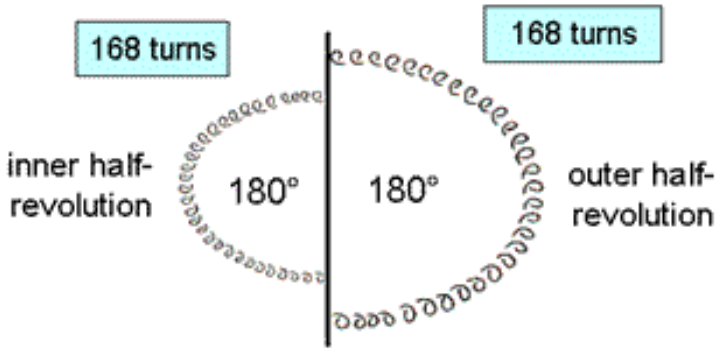
- The inner form of the Tree of Life with Type B polygons contains 1370 yods. This is the number of yods in 137 tetractyses, showing how the number 137 is linked to this sacred geometrical representation of the cosmic blueprint. Eight yods in each set of seven enfolded Type B polygons are shared with the outer Tree of Life constructed from tetractyses. They are the seven yods lining the vertical axis of the hexagon and the centre of the triangle, which coincides with a hexagonal yod belonging to the outer Tree of Life. Outside the root edge are (1370−4−8−8=1350) yods that are *intrinsic* to the inner Tree of Life, being unshared with its outer form. They correspond to the 1350 corners that surround the axes of the five Platonic solids. The 10 yods associated with each set of polygons that either belong to the root

Some structural parameters of the UPA

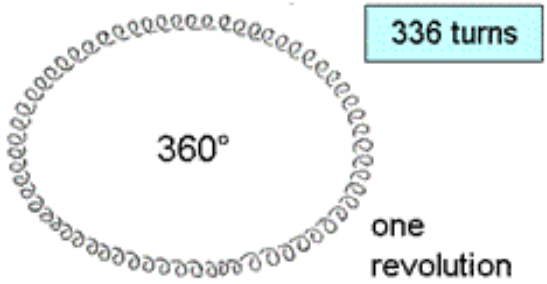


Every quarter-revolution of a helical whorl comprises 84 turns.

$84 = 4^1 + 4^2 + 4^3$
$= 1^2 + 3^2 + 5^2 + 7^2$

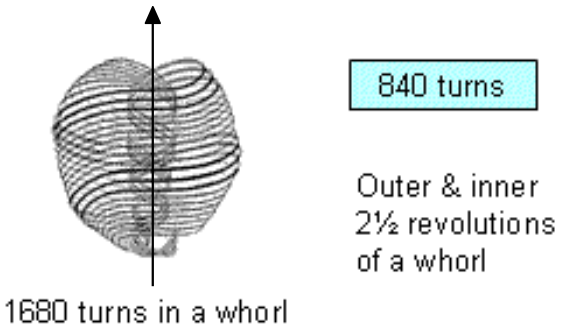


Every half-revolution of a helical whorl comprises **168** turns.



Every revolution of a helical whorl comprises 336 turns.

$336 = 4 \times 84 = 4^2 + 4^3 + 4^4$
$= 2^2 + 6^2 + 10^2 + 14^2$



The UPA is a set of 10 helices with a total of 16800 circular turns. They make **50** revolutions around the axis of the UPA (25 in its outer half and 25 in its inner half). Each half contains 8400 turns in the 10 helices. Each helical whorl contains 1680 turns (840 in the 2½ revolutions of its outer half and 840 in the 2½ revolutions of its inner half).

• edge or are shared consist of five hexagonal yods (one on the root edge and four on the vertical axis of the hexagon) and five corners. There are 1360 yods other than these 10 hexagonal yods. They correspond to the 1360 corners of the 2970 tetractyses in the five Platonic solids. These 1360 yods contain 10 corner yods, namely, the two endpoints of the root edge, the shared centres of the two triangles and the six shared corners on the vertical axes of the two hexagons. These two sets of five corners correspond to the two sets of five vertices at the ends of the axes of the five Platonic solids. As $1360 = 16\times85 = 4^2\times85$, where

$$85 = 4^0 + 4^1 + 4^2 + 4^3,$$

$$1360 = 4^2(4^0 + 4^1 + 4^2 + 4^3) = 4^2 + 4^3 + 4^4 + 4^5.$$

This illustrates the Tetrad Principle proposed in the author's Article 1 (available on his website).

• 648 yods line the 198 tetractyses in the tetrahedron. Surrounding its axis are 642 such yods. Two of them are vertices, so that it has **640** boundary yods other than vertices. This is the number value of *Shemesh*, the Mundane Chakra of Tiphareth.

• The faces of the icosahedron have **272** yods, as do the faces of the dodecahedron. This is the number value of *Cherubim*, the Order of Angels assigned to Yesod.

• 1290 yods line 396 tetractyses in the octahedron and cube. This is the number of yods in **129** tetractyses. **129** is the number value of YAHWEH SABAOTH (Lord of Hosts), the Godname of Netzach.

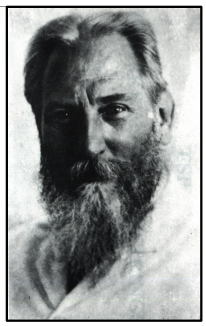
• The 1980 tetractyses in the first four Platonic solids have 908 corners. On average, they have 227 corners, where 227 is the **49**th prime number. This shows how they are prescribed by EL CHAI (אל חי) with number value **49**, part of SHADDAI EL CHAI (Almighty Living God), the Godname of Yesod.

• The **50** faces of the five Platonic solids contain 2160 hexagonal yods. On average, half a Platonic solid has five faces containing **216** hexagonal yods, where **216** is the number value of Geburah.

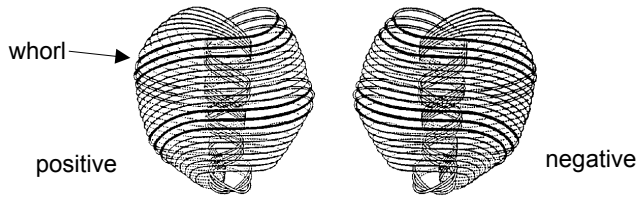
• Surrounding the axes of the five Platonic solids are 12600 yods. On average, a Platonic solid contains 2520 yods, **1260** yods in each half. The number **1260** is the number value of *Tarshishim* (תרשישים), the Order of Angels associated with Netzach.

• Surrounding the axis of the tetrahedron are 840 yods. This is the number of circular turns in the outer or inner half of a helical whorl of the particle ("UPA") remote-viewed by Annie Besant & C.W. Leadbeater

Annie Besant
1847–1933



C.W. Leadbeater
1854–1934



The UPA ("Ultimate Physical Atom") remote viewed by Annie Besant and C.W. Leadbeater has two chiral forms that they called "positive" and "negative." Both consist of 10 closed helices (whorls), each with 1680 circular turns, that wind five times around their axis of spin, making 2½ revolutions in its outer, spiral motion and 2½ revolutions in its narrower core (From *Occult Chemistry*, Annie Besant & C.W. Leadbeater (Theosophical Publishing House, Adyar, Chennai, India, 1951).

(*see* here) and identified by the author in his book "ESP of Quarks and Superstrings" (New Age International Ltd, Publishers, 1999) as the subquark state of the $E_8\times E_8'$ heterotic superstring. Surrounding the axis of the octahedron are 1680 yods (similarly for the cube). This is the number of turns in a *whole* whorl. The appearance of this structural parameter of the UPA is highly significant. The first three Platonic solids have 4200 yods surrounding their axes, as do the icosahedron and the dodecahedron. Expressed in units of 1680 yods, the numbers of yods surrounding the axes of the Platonic solids are:

tetrahedron
octahedron
cube
icosahedron
dodecahedron

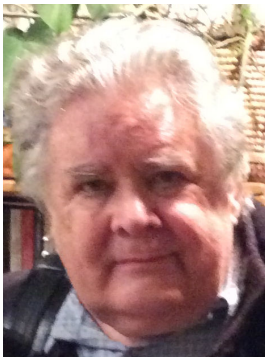
5 × (½, 1, 1) = 2½
(2½, 2½) = 5

Why this pattern of three sets of 2½ units exists is easy to explain. The total number of yods surrounding the axis of a Platonic solid with E edges and F faces, each a regular polygon with m corners, is

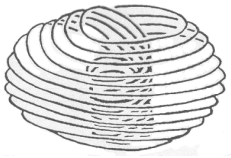
$$42E + \mathbf{49}mF,$$

where **49** is the number value of EL CHAI, part of the Godname of Yesod. Both E and mF for the octahedron are twice their corresponding values for the tetrahedron (12 and 24, compared with 6 and 12), so that their yod populations are twice as large, whilst for the icosahedron and dodecahedron they are both five times the latter values (30 and 60 compared with 6 and 12) This means that their yod populations are five times as large. The first *four* Platonic solids have five units of yods, as do the last two. As the basic unit of physical matter, the UPA comprises 10 helical whorls, each with 1680 circular turns, so that it comprises 16800 turns. The 8400 yods surrounding the axes of the first four Platonic

solids correspond to the 8400 turns in the outer or inner half of the whole UPA. The contribution of 3360 yods by the octahedron and cube correspond to the 3360 turns in one revolution of its 10 whorls. The appearance of the factor of five in the dodecahedron with 20 vertices is analogous to its property of being a compound of five similar tetrahedra, each with four vertices. Inspection of the columns in the two tables reveals that all the populations of yods surrounding the axis of the dodecahedron are exactly five times their counterparts for the first Platonic solid (the tetrahedron), whilst the populations for the first four Platonic solids are exactly 10 times their counterparts for the tetrahedron. All the various types of yod populations for the complete set of five Platonic solids are **15** times their counterparts for the tetrahedron, reflecting the fact that they have 90 edges, which is **15** times as many as the tetrahedron with 6 edges, whilst their **50** faces have 180 sectors, i.e., **15** times that of the tetrahedron, whose faces have 12 sectors. The constant factor of **15** for the whole yod population and its split into the factor of 10 for the total yod populations of the first four Platonic solids and the factor of 5 for those of the dodecahedron mirror the number 10 of the Hebrew letter yod (י) and the number 5 of the letter he (ה) in the Divine Name YAH (יה), which has the number value **15** and mathematically prescribes the properties of the five regular polyhedra, as all the Divine Names do. Inspection of the tables of yod populations confirms that, for every type of population of yods *surrounding their axes*, the factors for the tetrahedron, octahedron, cube, icosahedron and dodecahedron are, respectively, ×1, ×2, ×2, ×5 and ×5. The tetrahedron and either the icosahedron or the dodecahedron have three units of yods surrounding their axes, that is, (3×1680=5040) yods. This is highly significant for the following reason: during the 1990s, the author collaborated with Ronald D. Cowen, a Canadian Buddhist who claimed to exercise the same ability to remote-view the subatomic world as what Annie Besant and C.W. Leadbeater said they had (*see his book "The Path of Love" (FriesenPress, Canada, 2015*). As well as confirming their description of the UPA as the basic constituent of atoms, Cowen claimed that he could remote-view an equally fundamental type of particle that has escaped scientific detection because it does not interact with ordinary matter except gravitationally. His observations indicated that it is the basic constituent of an invisible type of matter that the author believes is the main constituent of what astronomers call "dark matter" (*see* here). According to Cowen, instead of having ten whorls like the UPA, this particle, which is as yet undiscovered by particle physics, consists of five whorls, each a closed helix that winds three times in an outer spiral around its axis of spin and then three times in a narrower, inner spiral, making six complete revolutions, not the five revolutions of each whorl in the UPA. The five whorls in Cowen's particle make **15** outer revolutions and **15** inner revolutions around its axis, whereas the 10 whorls of the UPA make 25 outer and 25 inner revolutions around its axis. His research connecting the descriptions of the UPA by Besant & Leadbeater to sacred geometries led the author to predict that each helical whorl in this equally fundamental particle contains 2016 turns. This implies that the outer or inner half of the particle contains 5040 turns in its five helical whorls, a total of 10080. As 5040 = 3×1680, each of its three outer or three inner revolutions contains 1680 turns. This is analogous to the 5040 yods (three units of 1680 yods) surrounding the axes of the tetrahedron and either the icosahedron or the dodecahedron. The five Platonic solids have 7½ units of yods surrounding their axes (**15** times the half-unit in the tetrahedron), whereas either half of the UPA and either half of Cowen's particle contain (5+3=8) units of turns. It means that we cannot pick out combinations of *different* Platonic solids to be associated with each type of basic particle. They are both represented, but not by combinations of *different* polyhedra. However, it is significant that the complete set allows two combinations generating five units and three units that share one Platonic solid, namely, the tetrahedron.



Ronald D. Cowen



Cowen's drawing of the basic constituent of an invisible kind of matter that pervades the universe. It consists of five helical coils that wind six times around its axis of spin, making three outer revolutions and three inner revolutions.

- Another way of relating the yod populations to the numbers of turns in the whorls of both the UPA and Cowen's particle is to consider the contribution by the Platonic solids to their *average* total yod population. Their contributions are listed below:

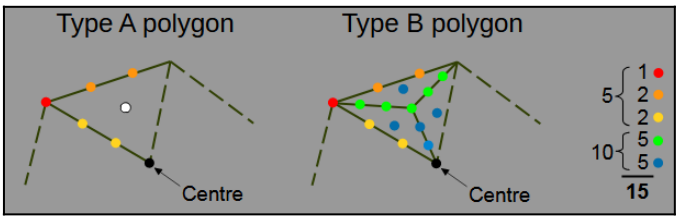
Platonic solid	Yod population	Contribution to average
Tetrahedron	840	**168**
Octahedron	1680	336
Cube	1680	336
Icosahedron	4200	2016 840 2016
Subtotal	8400	1680
Dodecahedron	4200	840
Total	12600	2520

The tetrahedron contributes **168** yods to the average population of 2520. This number is the number value of *Cholem Yesodoth*, the Mundane Chakra of Malkuth. The first four Platonic solids have 8400 yods, which is ten times as many yods as the tetrahedron. They contribute 1680 yods to the average. This is how the primary structural parameter of the UPA is embodied in the first four Platonic solids, as well as individually in the octahedron and in the cube. As the author identifies it as an $E_8 \times E_8'$ heterotic superstring, one of its structural parameters is embodied in the four Platonic solids associated by the ancient Greeks with the four physical Elements. The first three solids contribute 840 yods, as does the fourth solid. The counterpart of this equal division in the UPA is that each helical whorl consists of 1680 turns, of which 840 make up the 2½ revolutions of its outer spiral and 840 make up the 2½ revolutions of its inner spiral. The tetrahedron is associated with half a revolution, the octahedron with one revolution, the cube with one revolution, i.e., the first three solids contributing 840 yods to the average are associated with 2½ revolutions, and the icosahedron with 2½ revolutions. The contributions to the average yod population by the first four solids exhibit the same 2½:2½ division as the five revolutions of each whorl of the UPA. The 2016 turns in each whorl of Cowen's particle correspond to the 2016 yods contributed to the average yod population of a Platonic solid by the icosahedron, the dodecahedron and either the octahedron or the cube: 840 + 840 + 336 = 2016. The outer and inner halves of each whorl in this particle correspond to the two sets of halves of these three Platonic solids.

- The 1:2:2:5:5 pattern of proportion of every yod population shown by the five Platonic solids is due to their numbers of edges and face sectors being in the same ratios:

Platonic solid	Edges (E)	Face sectors (mF)	Factor
Tetrahedron	6	12	×1
Octahedron	12	24	×2 (×5)
Cube	12	24	×2
Icosahedron	30	60	×5
Dodecahedron	30	60	×5

The same proportion is exhibited in the **15** yods per sector of a Type B polygon. The five yods per sector that line each sector of the Type A polygon consist (referring to the diagram below) of one red corner (×1), two orange hexagonal yods (×2) on its outer side and two yellow hexagonal yods (×2) on its inner side. Its transformation into a Type B polygon adds 10 yods per sector. They consist of: 1. the five internal green yods that line two sides of the sector having a side of the polygon as its third side, and 2. five other blue yods:



The value 5 of the Hebrew letter he (ה) in the Godname YAH (יה) of Chokmah corresponds to the total factor of 5 provided by the tetrahedron, octahedron and cube. The letter value 10 of yod (י) corresponds to the total factor of 10 provided by the icosahedron and the dodecahedron.

The number of yods surrounding the axis of either the octahedron or the cube is 1680. On average, a half of each polyhedron contributes **168** yods to the 1260 yods that on average are in each half of a Platonic solid, where **168** is the number value of *Cholem Yesodoth*, the Mundane Chakra of Malkuth. This number is the number of turns in a half-revolution of a whorl of the UPA. Aptly, it is associated not only with Malkuth, the very Sephirah that signifies the material form of the Tree of Life (in the subatomic world, in the case of the UPA), but also with its Mundane Chakra. The number 1680 is mathematically linked to the number 33 well-known in Freemasonry because it is the number of yods in the lowest 33 Tree of Life of CTOL when their triangles are turned into tetractyses. The proof of this is as follows: the lowest n Trees of Life contain (12n+7) triangles with (6n+5) corners and (16n+9) sides. When each triangle becomes a tetractys, one hexagonal yod is at its centre and two hexagonal yods line every side. The total number of yods in n Trees = 6n + 5 + 2×(16n+9) + 12n + 7 = **50**n + 30. For n = 33, this is 1680. What the author predicts is the structural parameter 1680 of the subquark states of $E_8 \times E_8'$ heterotic superstrings is embodied in the lowest 33 Trees of Life. The number **168** is embodied in the lowest Tree of Life because, when each triangle is Type A, it adds one corner, three sides and three triangles, so that the total number of corners, sides & triangles in the lowest n Trees = 6n + 5 + 16n + 9 + 7(12n+7) = 106n + 63. For n = 1, this is 169. Below the top of the lowest Tree are **168** points, lines & triangles that create its shape. This Tree at the base of CTOL represents its most "Malkuth" level. Fittingly, it embodies the

number of circularly polarised oscillations made during a half-revolution of each whorl around the axis of spin of the UPA, as well as the contribution by the tetrahedron to the average number of yods surrounding the axis of a Platonic solid. Each whorl is associated with one of the 10 Sephiroth of the Tree of Life and is, itself, 10-fold because it makes 10 half-revolutions around the axis of the UPA. The Divine Name ELOHIM with number value **50** prescribes the whole UPA shaped by **50** complete revolutions (25 outer, 25 inner), just as it does the five Platonic solids with **50** vertices and **50** faces, 25 shaping each set of their halves.

- The (5040=6×840) helical turns in the outer or inner half of Cowen's particle and the (8400=10×840) turns in the outer or inner half of the UPA are matched by yods in the following possible combinations of Platonic solids with matching yod populations (that of the tetrahedron is taken as the unit):

UPA: 10 units → 1. tetrahedron + octahedron + cube + icosahedron/dodecahedron

or

2. icosahedron + dodecahedron

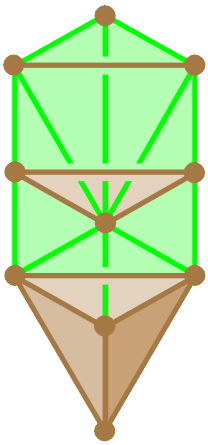
Cowen's particle: 6 units → tetrahedron + icosahedron/dodecahedron

In the case of the UPA, the icosahedron is favoured in option 1 over the dodecahedron because it signifies that the Platonic solids traditionally associated with the four *physical* Elements embody the number of circularly polarised oscillations in the string-like whorls in an outer or inner half of the UPA, which the author has identified as the subquark state of the $E_8 \times E_8'$ heterotic superstring. This implication seems appropriate, whereas, historically, the dodecahedron came to be associated with Aether, the fifth Element — a reason for rejecting option 2. In the case of Cowen's particle, the dodecahedron is favoured over the icosahedron because the particle, although still physical, is — like Aether — invisible (except, of course, to someone like Cowen with micro-psi vision). Given the ancient tradition of the Aether and its place in classical physics before Einstein's Special Relativity, this choice seems the more appropriate. It means that only the tetrahedron is common to both combinations: tetrahedron+octahedron+cube+ icosahedron for the UPA and tetrahedron+dodecahedron for Cowen's particle, which the author proposes as the basic particle making up dark matter.

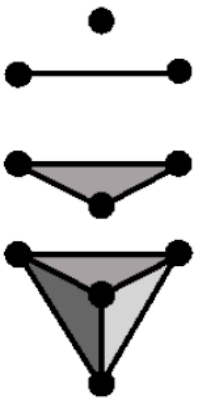
- The 5:10 proportion found in the yod populations of the first three and the last two of the five Platonic solids manifests also in the Tree of Life. It consists of 16 triangles with 10 corners and 22 sides, the lowest four corners occupied by Netzach, Hod, Yesod & Malkuth being the vertices of a tetrahedron. The author identifies the "trunk" of the Tree of Life as the four-fold, mathematical sequence:

point
line
triangle
tetrahedron

They are shown below coloured brown, which is the colour of many tree trunks:



Trunk (brown) & branches (green) of the outer form of the Tree of Life.



Trunk

point	line	triangle	tetrahedron	TOTAL	Number of yods
1				1	1
2	1			3	4
3	3	1		7	10
4	6	4	1	**15**	20
			TOTAL =	**26**	35

5:10 divisions in the trunk of the outer form of the Tree of Life.

The 23 lines & triangles making up the rest of the Tree of Life are called by the author its "branches;" they are coloured green. The table indicates that the trunk is made up of **26** points, lines, triangles & tetrahedra, where **26** is the number value of YAHWEH, the Godname associated with Chokmah. The first three members of the sequence (point, line & triangle) comprise 11 geometrical elements and the fourth (the tetrahedron) consists of **15** elements. As pairs of points define lines and groups of three points define triangles, these numbers are the sums of the numbers of combinations of one, two, three and four points:

$$\binom{1}{1} = 1$$

$$\binom{2}{1} + \binom{2}{2} = 2 + 1 = 3.$$

$$\binom{3}{1} + \binom{3}{2} + \binom{3}{3} = 3 + 3 + 1 = 7.$$

$$\binom{4}{1} + \binom{4}{2} + \binom{4}{3} + \binom{4}{4} = 4 + 6 + 4 + 1 = \mathbf{15}.$$

This 11:**15** division appears in M-theory and bosonic string theory as the 11 dimensions of space-time and the **15** higher dimensions of the **26**-dimensional space-time of bosonic strings required for the latter to be consistent with quantum mechanics. Their counterpart in the trunk of the Tree of Life are the **15** points, lines, triangles & tetrahedra that make up the tetrahedron. They consist of 10 points & lines and 5 triangles & tetrahedra. The complete trunk displays the same division because it consists of 10 points and five triangles. The former consists of five points in the first and fourth members of the sequence and five points in the second and third members. The trunk has the same 5:5:5 division as was found earlier in the various yod populations of the first three Platonic solids, the fourth and the fifth. The 5:10 division appears also in the first three members of the sequence when the triangles of the Tree of Life are turned into tetractyses. Five yods make up the point & line and 10 yods make up the triangle, now a tetractys. Corresponding to this 5:10 division of yods are the four points & lines in the first two members of the sequence (one point in the first and three points & lines in the second) and the seven points, lines & triangles in the third member (one triangle and six points & lines). Their counterparts in the 11 dimensions of space-time required by M-theory are the four dimensions of Einstein's space-time (time and three large-scale dimensions) and seven so-called "compactified dimensions." These are the six compactified dimensions required by superstring theory and either a segment extending along the tenth spatial dimension that separates the two 10-d space-time sheets required by $E_8 \times E_8'$ heterotic superstring theory or an extra circular dimension required for SO(32) heterotic superstring theory. The striking correspondence between the **26** geometrical elements in the *trunk* of the Tree of Life and the **26** dimensions of space-time required by quantum mechanics for spinless strings is summarised below:

point → one point → time;
line → 2 points & one line → 2 transverse + one longitudinal, large-scale dimensions;
triangle → one triangle & 6 points & lines → dimensional circle/segment + 6 compactified, superstring dimensions;
tetrahedron → 10 points & lines + 5 triangles & tetrahedra → 10 dimensions + 5 dimensions.

The 10 whorls in the UPA and the five whorls in Cowen's particle would be another manifestation of this 10:5 split in the **15** higher compactified dimensions if they were due to the curling up of these dimensions. Evidence suggesting that this, indeed, is the case is that, according to Besant & Leadbeater, each of the 1680 circular turns in a helical whorl is, itself, a helical coil composed of seven smaller, similar circles and that there are six successively smaller types of helices, each winding in circles whose planes are perpendicular to one another. What they were actually describing are the six circular, compactified dimensions of a so-called "6-torus." This is a model of the 6-dimensional compact space that string theorists have used in analysing superstring theory, although they have regarded it only as an unrealistic "toy model" to facilitate their analysis. This picture is persuasive confirmation that the UPA is a superstring because it displays various features strongly indicative of six higher dimensions that are identical to those that have been discussed for superstrings in journals of theoretical physics.

More evidence that the UPA/superstring structural parameters **168**, 336, 840 and 1680 are embodied in the first four Platonic solids is provided by their geometrical composition when constructed from Type A triangles. Formulae for the number of points, lines & triangles in their faces, interiors & their totals are given below:

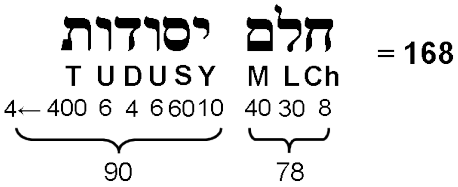
Faces
Number of points ≡ C = V + F = 2 + E.
Number of lines ≡ S = E + mF.
Number of triangles ≡ T = mF.
Number of geometrical elements ≡ G = C + S + T = 2 + 2E + 2mF.
As before, "2" denotes the endpoints of the axis. "4" denotes the two straight lines forming this axis.

Interior
Number of points ≡ c = E + mF.
Number of lines ≡ s = 2 + 4E + 3mF.
Number of triangles ≡ t = 3E + 3mF.
Number of geometrical elements ≡ g = c + s + t = 2 + 8E + 7mF.
Total number of geometrical elements = G + g = 4 + 10E + 9mF.
"4" denotes the two lines and their endpoints that make up the axis.
The table below lists G, g and their sums (as before, the centre of the Platonic solid is excluded from the calculations):

Platonic solid	Faces (G)	Interior (g)	Total (G+g)
Tetrahedron	2 + **36** = 38	2 + 132 = 134	4 + **168** = 172
Octahedron	2 + 72 = 74	2 + 264 = 266	4 + 336 = 340
Cube	2 + 72 = 74	2 + 264 = 266	4 + 336 = 340
Icosahedron	2 + 180 = **282**	2 + 660 = 662	4 + 840 = 844
Subtotal	8 + 360 = 368	8 + 1320 = 1328	16 + 1680 = 1696
Dodecahedron	2 + 180 = **282**	2 + 660 = 662	4 + 840 = 844
Total	10 + 540 = 550	10 + 1980 = 1990	20 + 2520 = 2540

Comments

- The 38 Type A faces of the first four Platonic solids contain **282** points, where **282** is the number value of *Aralim* (Thrones), the Order of Angels assigned to Binah. All five Platonic solids have 550 points in their **50** faces. This is the number of SLs in CTOL. The 10 points at the ends of their axes correspond to the 10 SLs below the top of its lowest Tree and the 540 points surrounding them correspond to the 540 SLs in CTOL down to the top of this Tree.
- Surrounding the axis of the tetrahedron are **168** geometrical elements. This is the number of turns in a half-revolution of a helical whorl of the UPA around its axis. Surrounding the axis of the octahedron are 336 geometrical elements; similarly for the cube. This is the number of turns in one revolution of a whorl around the axis of the UPA. Surrounding the axis of the icosahedron are 840 geometrical elements. This is the number of turns in an outer or inner half of a whorl. Surrounding the axes of the first four Platonic solids are 1680 geometrical elements. This is the number of turns in a whole whorl of the UPA. We see that the superstring structural parameters **168**, 336, 840 and 1680 are embodied in the geometry of the first four Platonic solids that the ancient Greeks believed were the shapes of the particles of the four Elements Fire, Air, Water and Earth. Remarkably, these numbers appear in *both* the yod and geometrical compositions of these Platonic solids — further evidence that their presence cannot be due to chance. Surrounding the axis of a Platonic solid are (2E+mF) points, (5E+4mF) lines and (3E+4mF) triangles. Surrounding the axes of the first four Platonic solids with 60 edges and 120 sectors of faces are 240 points, 780 (=78×10) lines and 660 triangles, i.e., 900 (=90×10) points & triangles. Surrounding the axis of the tetrahedron are **168** geometrical elements (78 lines and 90 points & triangles). These two numbers are the number values of *Cholem* and *Yesodoth*, the two Kabbalistic words making up the name of the Mundane Chakra of Malkuth:



- The total number of points in the first four Platonic solids constructed from Type A triangles = 8 + 240 = **248**. This is the dimension of E_8, the symmetry group governing the unified forces between singlet states of $E_8 \times E_8'$ heterotic superstrings. This conjunction i*n the very same context* between the dynamical parameter **248** of this type of superstring and the structural parameter 1680 of the remote-viewed particle that the author has identified as being a state of this superstring is powerful evidence of the correctness of his identification.

Polyhedron with Type B faces & internal triangles

We shall now examine the geometrical composition of the five Platonic solids when their faces are Type B polygons and their interior triangles are Type B.

Faces

Number of corners ≡ C = V + F + mF = 2 + E + mF.
Number of sides ≡ S = E + 4mF.
Number of triangles ≡ T = 3mF.
Number of geometrical elements ≡ G = C + S + T = 2 + 2E + 8mF.

The number "2" denotes (in the case of the octahedron, cube, icosahedron & dodecahedron) the two diametrically opposite vertices or (in the case of the tetrahedron), the two vertices at the ends of any edge.

Interior

Number of corners (excluding the polyhedral centre) ≡ c = 4E + 4mF.
Number of sides ≡ s = V + F + 12E + 12mF = 2 + E + 12E + 12mF = 2 + 13E + 12mF.
Number of triangles ≡ t = 9E + 9mF.
Number of geometrical elements ≡ g = c + s + t = 2 + **26**E + 25mF.

The number "2" denotes the two internal sides passing through the centre that are shared by all internal Type

B triangles.

Total number of corners (excluding the centre) = C + c = 2 + E + mF + 4E + 4mF = 2 + 5E + 5mF.
Total number of sides = S + s = 2 + 14E + 16mF.
Total number of triangles = T + t = 9E + 12mF.
Total number of geometrical elements (excluding the centre) = G + g = 4 + 28E + 33mF.

Tabulated below are the numbers of corners, sides, triangles & geometrical elements in the Type B polygonal faces and internal triangles of each Platonic solid.

Geometrical composition (excluding centres) of the five Platonic solids (Type B)

Platonic solid	Number of corners C + c	Number of sides S + s	Number of triangles T + t	Faces G	Interior g	Total G + g
Tetrahedron	2+90=92	2+276=278	198	2+108=110	2+456=458	4+564=568
Octahedron	2+180=182	2+552=554	396	2+**216**=218	2+912=914	4+1128=1132
Cube	2+180=182	2+552=554	396	2+**216**=218	2+912=914	4+1128=1132
Icosahedron	2+450=452	2+1380=1382	990	2+540=542	2+2280=2282	4+2820=2824
Subtotal	8+900=908	8+2760=2768	1980	8+1080=1088	8+4560=4568	16+5640=5656
Dodecahedron	2+450=452	2+1380=1382	990	2+540=542	2+2280=2282	4+2820=2824
Total	10+1350=1360	10+4140=4150	2970	10+1620=1630	10+6840=6850	20+8460=8480

Comments

- The inner Tree of Life with Type B polygons contains 1370 yods. The centre of each triangle is shared with the outer Tree of Life when its triangles are turned into tetractyses because it is a hexagonal yod lying on the Path connecting Chesed and Geburah. The seven yods lining the vertical sides of sectors of each hexagon are shared with the outer Tree because these sides are the Paths connecting Chesed to both Chokmah and Netzach. The number of yods in the (7+7) enfolded polygons that are outside the root edge and unshared = 1370 − 4 − 1 − 7 − 1 − 7 = 1350. The 2970 triangles in the five Platonic solids have 1350 corners surrounding their axes. *These corners are the counterparts of the yods outside the root edge that are intrinsic to the inner Tree of Life*. The 20 yods that either belong to the root edge or are shared consist of 10 corners of tetractyses and 10 hexagonal yods. The number of yods outside the root edge that are not hexagonal yods shared with the outer Tree = 1370 − 10 = 1360 = 136×10, where

  $$136 = 1 + 2 + 3 + \ldots + 16$$

  is the 16th triangular number. Amazingly, this number is the sum of the gematria number values of Malkuth (**496**), its Godname (**65**), its Archangel (**280**), its order of Angels (**351**) and its Mundane Chakra (**168**):

  $$\mathbf{496} + \mathbf{65} + \mathbf{280} + \mathbf{351} + \mathbf{168} = 1360.$$

  This property is, of course, not a coincidence but, instead, an illustration of the transcendental, mathematical *design* of the system of number values of the 10 Sephiroth in the four Kabbalistic Worlds. We found earlier that 1360 is the sum of the four consecutive powers of 4, starting with 2:

  $$4^2 + 4^3 + 4^4 + 4^5 = 1360.$$

  It is highly improbable that this number could possess these two properties merely by chance. The 10 corners of the 94 sectors of the (7+7) enfolded Type B polygons that are either shared or endpoints of the root edge consist of five pairs: the two endpoints of the root edge and the four corners in one set of polygons that are paired with their counterparts in the other set. These five pairs correspond to the five pairs of vertices lying on the axes of the five Platonic solids, each pair being denoted by the number 2 in the formula given above for the number of corners of triangles in either their faces or interiors. The number 1350 also appears in the icosahedron and the dodecahedron because each has 990 triangles with 1380 sides surrounding their axes, i.e., (1380−30=1350) sides other than the 30 edges of each polyhedron.

  Suppose that we cut each Platonic solid into its two halves, adding its centre to each (now separated) half to complete its geometry, this point being a corner of internal triangles. The 10 separate halves consist of (1360+10=1370) corners. Every corner now corresponds to a yod in the (7+7) enfolded Type B polygons of the inner Tree of Life. The number of geometrical elements *inside* the five Platonic solids = 10 + 6840 = 6850. The average number = 2 + 1368 = 1370. Compare this with the inner form of successive, overlapping Trees of Life. The topmost corners of the two hexagons in one set of (7+7) enfolded polygons coincide with the lowest corners of the hexagons belonging to the inner form of the next higher Tree, leaving 1368 yods that not shared. The two shared corners correspond to the two lines

that form the internal axis of the average Platonic solid, whilst the 1368 yods that are intrinsic to the inner form of a given Tree correspond to the 1368 internal geometrical elements surrounding this axis.

- The average number of corners (excluding its centre) in a Platonic solid = 1360/5 = **272**, where **272** is the number value of *Cherubim*, the Order of Angels assigned to Yesod. The average number of corners in half a Platonic solid = **272**/2 = 136. Including its centre (a point which is shared by both average halves because it is a corner of triangles inside either half) there are on average 137 corners shaping each half of a Platonic solid. This is the number whose reciprocal is the approximate value of the fine-structure constant $\alpha = e^2/\hbar c \approx 1/137$. This measures the strength of the coupling of the electron to the electromagnetic field. The number 137 is the 33rd prime number, where

  $$33 = 1! + 2! + 3! + 4!.$$

  It is the number of tetractyses that have the same number of yods as that filling the inner form of the Tree of Life, namely, 1370 (= 137×10) yods.
- 564 geometrical elements surround the axis of the tetrahedron, **282** in each half. This is the number value of *Aralim* ("Thrones"), the Order of Angels assigned to Binah. The number of geometrical elements surrounding the axis of either the icosahedron or the dodecahedron is 2820 = **282**×10, i.e., the number of yods in **282** tetractyses.
- The average number of triangles in a Platonic solid = 2970/5 = 594. Each set of seven separate Type A polygons making up the inner form of the Tree of Life contains 295 yods. The number of yods in both sets separated by the root edge = 295 + 4 + 295 = 594.
- The five Platonic solids have 8480 geometrical elements surrounding their centres. The average half of a Platonic solid is made up of 848 such elements. Including the centre, the average half has 849 geometrical elements. As the five Platonic solids have 90 edges, there are nine edges in the average half, so that it is made up of (849−9=840) geometrical elements other than edges. When the centre is included in the geometrical composition of each average half, the latter become mathematically complete. The two separate, *complete* halves of a Platonic solid comprise, on average, (840+840=1680) geometrical elements other than edges. This compares with the 1680 circular turns of each whorl of the UPA (840 in its outer half and 840 in its inner half). An average half consists of 137 points, 406 lines other than edges and 297 triangles. EHEIEH ASHER EHEIEH ("I am that I am", Ex. 13:14) is the Godname of Kether with number value **543**. It prescribes the five Platonic solids because their average half consists of (137+406=**543**) points & lines other than edges.
- There are 1630 geometrical elements in the **50** faces of the five Platonic solids, i.e., (1630−90=1540) geometrical elements other than edges. On average, the faces of a Platonic solid contain (1540/5=308) geometrical elements other than edges. Including the two lines that form its axis, there are 310 (= **31**×10) such geometrical elements. The Godname EL ("God") of Chesed with number value **31** prescribes how many geometrical elements other than edges in the faces and axis of the average Platonic solid surround its centre. Including the latter, the total number of geometrical elements other than edges that, on average, make up the faces and axis of a Platonic solid = **311**. This is the gematria number value of *Tzaphkiel* (צפקיאל, "Contemplation of God"), the Archangel associated with Binah, whose Godname ELOHIM has the number value **50** specifying the **50** points in 3-dimensional space that are occupied by the **50** vertices of the five Platonic solids.

Conclusion

The table of number values of the 10 Sephiroth, their Godnames, etc., given at the beginning of this article lists 54 different Kabbalistic numbers. Analysis of the various yod populations of the five Platonic solids has revealed 50% of them, and more detailed discussion would, no doubt, reveal more (in fact, it should reveal *all* of them, as these numbers collectively characterise *any* object or set of objects possessing sacred geometry). It is highly improbable that the presence of such a high percentage of this collection of numbers could be due to chance. In the context of the article, their appearance is not due to cherry-picking by the author but is entirely natural, always quantifying only *whole* sets of yods or various combinations of them. These numbers measure the yod and geometrical compositions of the Platonic solids constructed from tetractyses or basic triangles because they parameterise *any* representation of the divine blueprint, whether it be the Tree of Life, its regular polyhedral counterpart or some other sacred geometry. If a geometrical object or a set of objects constitutes *real*, sacred geometry, these numbers will *always* quantify its properties. It cannot be reasonably denied that the appearance of the paranormally-derived numbers 840, 1680, 3360 & 8400 in both the yod and geometrical compositions of the first four Platonic solids, as well as the dimension **248** of the exceptional Lie group E_8 describing unified, superstring forces, constitutes persuasive evidence that the UPA is an $E_8 \times E_8'$ heterotic superstring. To dismiss as coincidence the remarkable conjunction *in exactly the same context* of both these structural and dynamical parameters is tantamount to believing in miracles. It is not a plausible, alternative explanation for why all these numbers manifest as yod populations of the properties of the Platonic solids. It is not as though they refer to populations of different categories of yods that happened to add up to the numbers in question, for — against all odds — they all refer to *one* type of population, namely, the total population. Is it not more reasonable to conclude that the belief among the

ancient Greeks that the first four Platonic solids were the shapes of the particles of the four physical Elements — although not true — *did* contain a correct insight? Instead of referring to atoms of the chemical elements, their shapes embody *numbers* that quantify the forces and form of superstrings making up both ordinary matter and dark matter. As sacred geometry, the three-dimensional Platonic solids encode the oscillatory nature of the $E_8 \times E_8'$ heterotic superstring as it exists in these two fundamental types of matter.