

ARTICLE 7

ENCODING OF SUPERSTRING PARAMETERS 248 & 168 IN THE (5+5) POLYGONS

by

Stephen M. Phillips

Flat 7, "Grangewood," 40 Norwich Avenue West. Bournemouth. Dorset BH2 6AW. ENGLAND

E-mail: stephen@smphillips.8m.com

Website: <http://smphillips.8m.com>

1. PATTERNS WITHIN PATTERNS

In Article 4 it was shown how the ten Hebrew Divine Names mathematically prescribe different

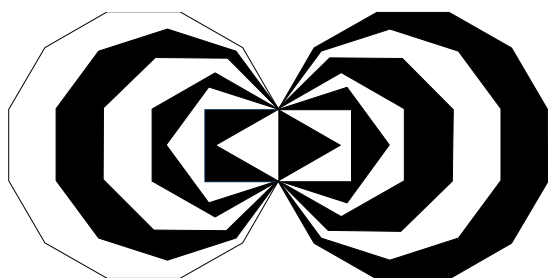


Figure 1

(*fig. 1*). They are enfolded in one another and share a so-called 'root edge,' from which each polygon is generated in turn on either side of it as mirror images of each other. Although this

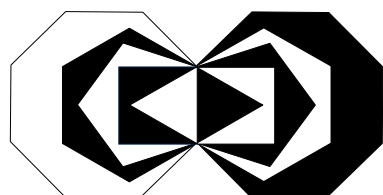


Figure 2

geometrical construction has long been known in a formal sense to mathematicians, they have never understood its *true* significance, which transcends issues of pure geometry, requiring the cipher of the Pythagorean tetractys and an understanding of the Divine Names to decode the information about the nature of spiritual and physical reality that this cosmic blueprint contains.

In Article 4 — and in more detail in the author's book (2) — the subset of the fourteen regular polygons consisting of the seven polygons enfolded on one side of the root edge and the five polygons with most corners on its other side were shown to encode the Tree of Life mapping of what Theosophists call the 'seven cosmic planes' (3). The first six regular polygons on each side

of their shared root edge have been shown (4) to encode the number 1680 as the structural parameter of the superstring constituents of up and down quarks (see previous articles). Both these subsets of the complete set of polygons were demonstrated to be ‘Tree of Life patterns’ in themselves because their properties are prescribed by the number values of the ten Hebrew Godnames. As Article 3 argued, this is a necessary condition for an object to constitute what writers all too loosely have called ‘sacred geometry.’ This article will explore the properties of a new subset, namely, the first five of the seven polygons (*fig. 2*) enfolded on either side of their shared root edge. Their prescription by the Divine Names indicates that these (5+5) regular polygons constitute a new Tree of Life pattern. It suggests that they should embody various basic parameters of the superstring encountered in previous discussions of other such patterns. The article confirms this in a remarkable way.

2. PROPERTIES OF THE FIRST 5 REGULAR POLYGONS

The basic properties of the five regular polygons shown in Figure 2 are listed below. The case of separate polygons is examined first and then the enfolded polygons are analysed. Both sets of polygons are also considered in each case. Numbers in **boldface** indicate number values of Sephiroth, their Godnames, Archangelic Names, Angelic Names or Mundane Chakras (see table 1). Each polygon is divided into its triangular sectors, which are then turned into tetractyses. ‘Hexagonal yods’ (so-called because they form the corners and centre of a hexagon) are those yods that are not corners of tetractyses.

	triangle	square	pentagon	hexagon	octagon
Number of corners =	3	4	5	6	8
Number of yods =	19	25	31	37	49

5 separate polygons

1. Number of corners of 5 polygons = $3 + 4 + 5 + 6 + 8 = \mathbf{26}$;
2. Number of sides of polygons = **26**;
3. Number of corners and sides of polygons = $\mathbf{26} + \mathbf{26} = 52$;
4. Number of tetractyses = **26**;
5. Number of corners of **26** tetractyses = $\mathbf{26} + 5 = \mathbf{31}$;
6. Number of sides of tetractyses = $2 \times \mathbf{26} = 52$;
7. Number of corners and sides of tetractyses = $\mathbf{31} + 52 = 83$;
8. Number of sides and tetractyses = $52 + \mathbf{26} = 78$;
9. Number of tetractyses and their corners and sides = $83 + \mathbf{26} = 109$;
10. Including their separate root edge, number of geometrical elements = $109 + 3 = \mathbf{112}$;
11. Number of hexagonal yods = $5 \times \mathbf{26} = 130$;
12. Number of yods = $6 \times \mathbf{26} + 5 = 161$;
13. Number of yods on boundaries of polygons = $\mathbf{26} + 2 \times \mathbf{26} = 78$ (52 hexagonal);
14. Number of yods on boundaries of tetractyses = $\mathbf{26} + 2 \times \mathbf{26} + 2 \times \mathbf{26} + 5 = 135$.

(5+5) separate polygons

1. Number of corners of 10 polygons = $2 \times 26 = 52$;
2. Number of sides of polygons = $2 \times 26 = 52$;
3. Number of corners and sides of polygons = $2 \times 52 = 104$;
4. Number of tetractyses = $2 \times 26 = 52$;
5. Number of corners of 52 tetractyses = $2 \times 31 = 62$;
6. Number of sides of tetractyses = $2 \times 52 = 104$;
7. Number of corners and sides of tetractyses = $62 + 104 = 166$;
8. Number of sides and tetractyses = $104 + 52 = 156$;
9. Number of tetractyses and their corners and sides = $166 + 52 = 218$;
10. Including their root edge, number of geometrical elements = $218 + 3 = 221$. These include $(2 + 31 + 31 = 64)$ corners;
11. Number of hexagonal yods = $2 \times 130 = 260 = 26 \times 10$;
12. Number of yods = $2 \times 161 = 322$;
13. Number of yods on boundaries of polygons = $2 \times 78 = 156$ (104 hexagonal);
14. Number of yods on boundaries of tetractyses = $2 \times 135 = 270$.

5 enfolded polygons

1. Number of corners of polygons = $26 - 4 \times 2 = 18$ (16 outside root edge);
2. Number of sides of polygons = $26 - 4 = 22$ (21 outside root edge);
3. Number of corners and sides of polygons = $18 + 22 = 40$ (37 outside root edge);
4. Number of tetractyses = 25;
5. Number of corners of tetractyses = $31 - 4 \times 2 - 1 = 22$ (20 outside root edge);
6. Number of sides of tetractyses = $52 - 4 - 2 = 46$ (45 outside root edge);
7. Number of corners and sides of tetractyses = $22 + 46 = 68$ (65 outside root edge);
8. Number of sides and tetractyses = $46 + 25 = 71$ (70 outside root edge);
9. Number of tetractyses and their corners and sides = $68 + 25 = 93$ (91 outside root edge);
10. Number of hexagonal yods = $130 - 4 \times 2 - 2 - 2 - 1 = 117$ (115 outside root edge);
11. Number of yods = $161 - 4 \times 4 - 2 - 2 - 1 - 1 = 139$ (135 outside root edge);
12. Number of yods on boundaries of polygons = $22 \times 2 + 18 = 62$ (58 outside root edge);
13. Number of yods on boundaries of tetractyses = $22 + 46 \times 2 = 114$ (110 outside root edge).

(5+5) enfolded polygons

1. Number of corners of (5+5) polygons = $2 \times 16 + 2 = 34$ (32 outside root edge);
2. Number of sides of polygons = $2 \times 21 + 1 = 43$ (42 outside root edge);
3. Number of corners and sides of polygons = $34 + 43 = 77$ (74 outside root edge);
4. Number of tetractyses = $2 \times 25 = 50$;
5. Number of corners of tetractyses = $2 \times 20 + 2 = 42$ (40 outside root edge);
6. Number of sides of tetractyses = $2 \times 45 + 1 = 91$ (90 outside root edge);
7. Number of corners and sides of tetractyses = $2 \times 65 + 3 = 133$ (130 outside root edge);
8. Number of sides and tetractyses = $2 \times 70 + 1 = 141$ (140 outside root edge);
9. Number of tetractyses and their corners and sides = $2 \times 91 + 3 = 185$ (182 outside root edge);
10. Number of hexagonal yods = $2 \times 115 + 2 = 232$ (230 outside root edge);
11. Number of yods = $2 \times 135 + 4 = 274$ (270 outside root edge);
12. Number of yods on boundaries of polygons = $2 \times 58 + 4 = 120$ (116 outside root edge). Number of yods inside polygons = $274 - 120 = 154$ (77 per set of 5 polygons);
13. Number of yods on boundaries of tetractyses = $2 \times 110 + 4 = 224$ (220 outside root edge);
Number of yods other than corners of polygons = $274 - 34 = 240$. Of these, $(4 + 4 = 8)$ are centres of polygons, leaving 232 yods that are not corners of tetractyses.

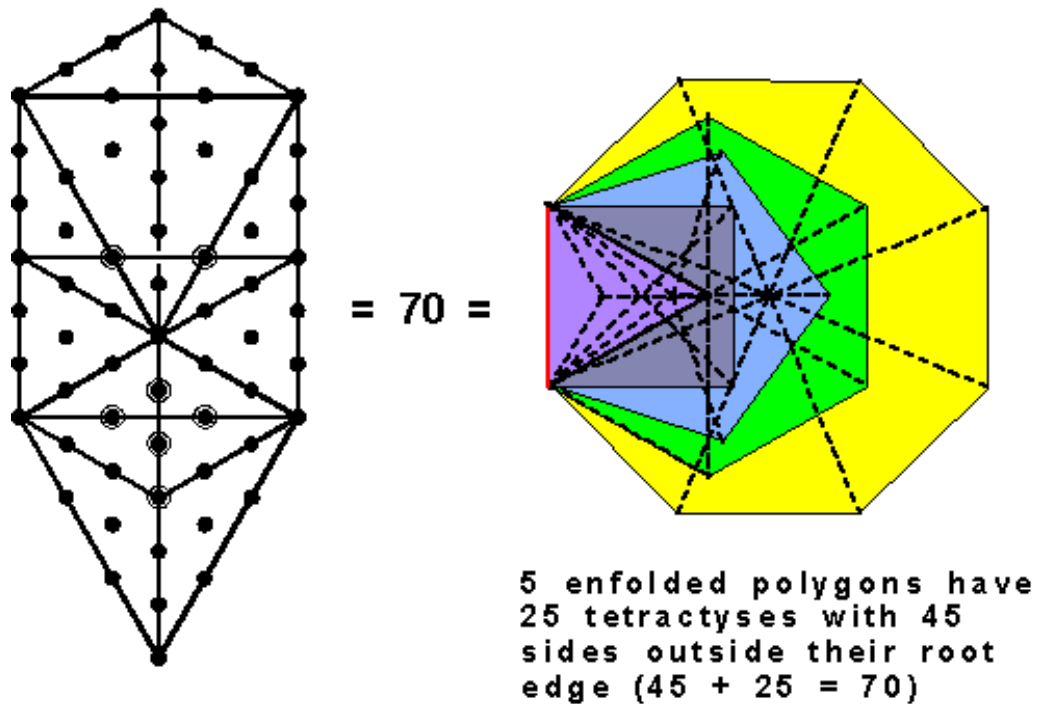


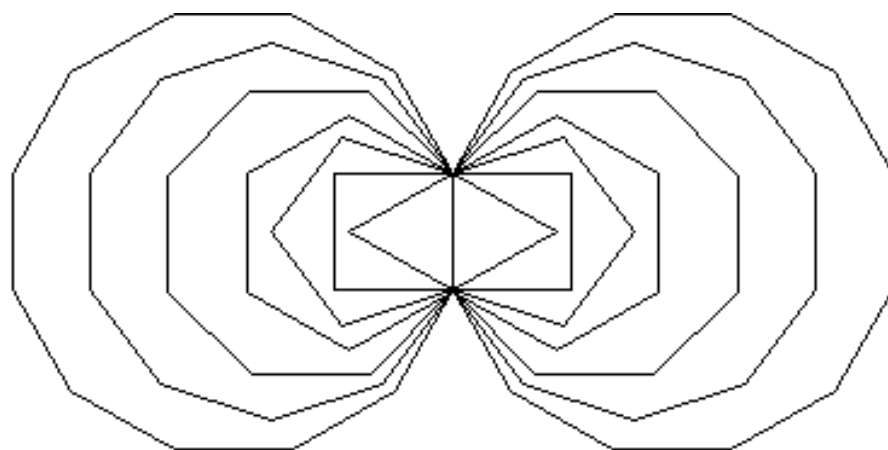
Figure 3. The equivalence of the Tree and the first 5 enfolded, regular polygons.

3. HOW GODNAMES PRESCRIBE THE FIVE POLYGONS

Set out below are the ways in which properties of the sets of five and (5+5) polygons are prescribed by the number values of the Sephirothic titles, their Godnames, Archangelic Names, Angelic Names and Mundane Chakras:

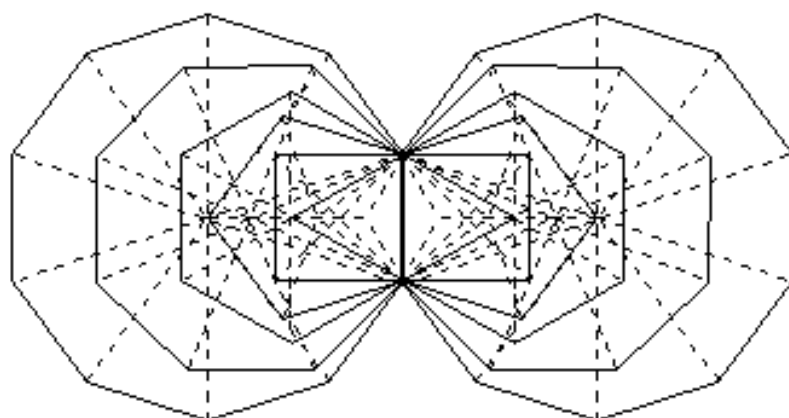
- Kether: **21** 21 sides of 5 enfolded polygons outside root edge.
- Chokmah: **15** 93 tetractyses and their corners and sides in 5 enfolded polygons, where $93 = 47\text{th}$ odd integer and $47 = 15\text{th}$ prime number. Also, 5 enfolded polygons have 47 corners and tetractyses;
- 26** Number of corners or sides or tetractyses in 5 separate polygons. Also, number of hexagonal yods in (5+5) separate polygons = $260 = 26 \times 10$;
- Binah: **50** (5+5) enfolded polygons have **50** tetractyses;
- Chesed: **31** 31 corners of **26** tetractyses in 5 separate polygons;
- Geburah: **36** Number of sides and tetractyses of 5 enfolded polygons = $71 = 36\text{th}$ odd integer;
- Tiphareth: **76** Number of yods inside boundaries of 5 enfolded polygons = $77 = 76\text{th}$ integer after 1;
- Netzach: **129** Number of hexagonal yods in 5 separate polygons = $130 = 129\text{th}$ integer after 1;
- Hod: **153** Number of yods inside (5+5) enfolded polygons = $154 = 153\text{rd}$ integer after 1;
- Yesod: **49** Number of tetractyses in (5+5) enfolded polygons = $50 = 49\text{th}$ integer after 1;

70 corners



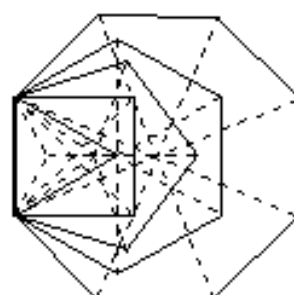
(7+7) regular polygons

70 tetractyses



(6+6) regular polygons

70 tetractyses and their sides
outside the root edge



5 regular polygons

Figure 4

Malkuth: **65** Number of hexagonal yods in 5 separate polygons = 130 = **65th** even integer.
 Also, **65** corners and sides of tetractyses outside root edge of 5 enfolded polygons;
155: Number of tetractyses and their sides in 5 separate polygons = 156 = **155th** integer
 after 1. Also, 156 is the number of yods on the boundaries of (5+5) separate
 polygons.

4. GENERAL DISCUSSION

Apart from their prescription by the Godnames, the (5+5) enfolded polygons conform to a Tree of Life pattern because each set has 70 tetractyses and their sides outside the root edge (*fig. 3*). This compares with the 70 yods in a Tree of Life whose triangles are tetractyses, the 70 corners of the (7+7) enfolded polygons and the 70 tetractyses of the first (6+6) enfolded polygons (*fig. 4*). A subset of the inner form of the Tree of Life comprising 70 geometrical elements is itself a Tree of Life pattern prescribed by the Godname numbers of the Sephiroth, as well as by the number values of their Archangels, Angels and Mundane Chakras, which are set out in the table below:

TABLE 1. NUMBER VALUES OF THE SEPHIROTH

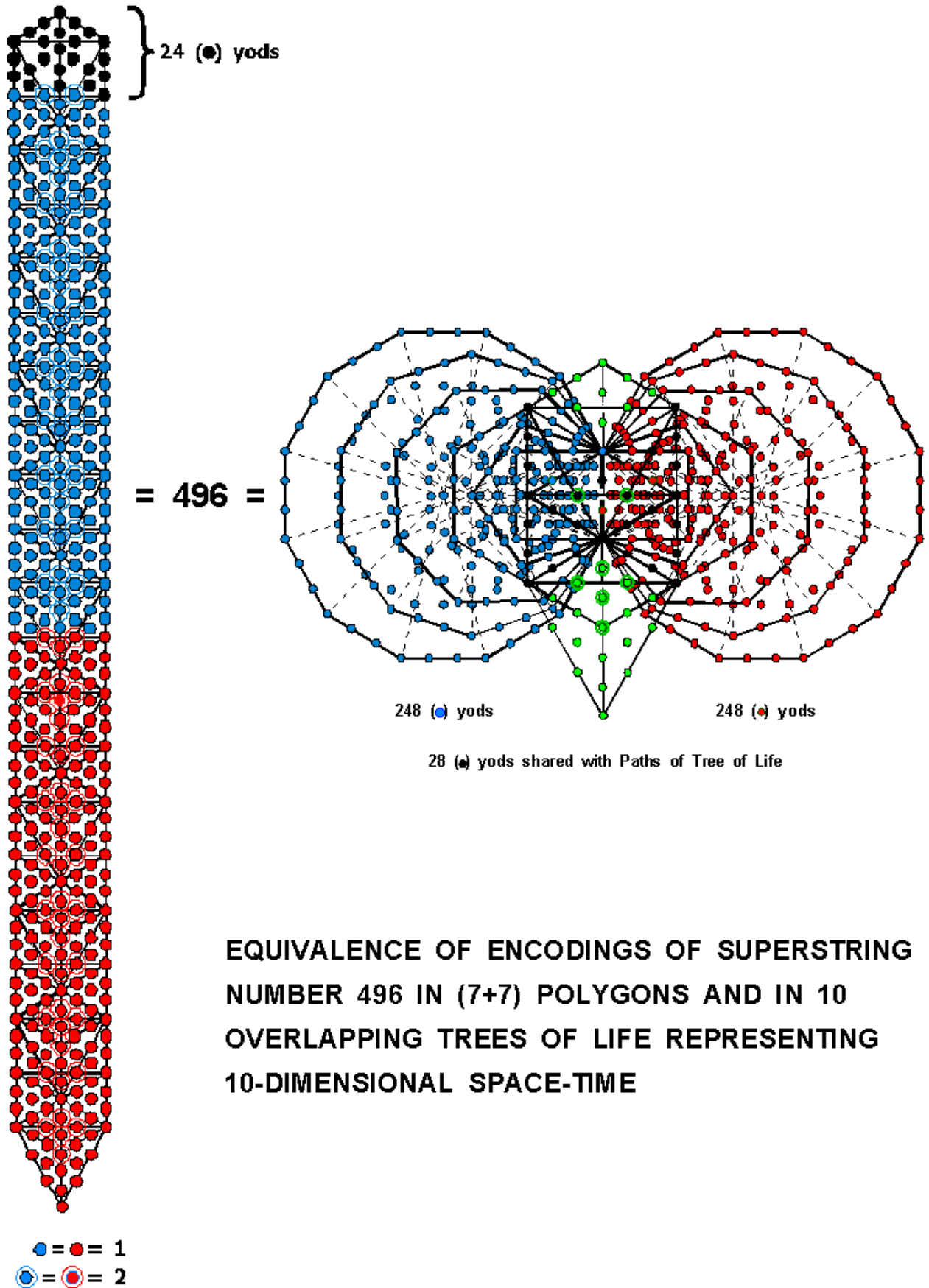
(All such numbers appearing in text are written in **boldface**. Cited numbers are in shaded boxes)

Sephirah	Title	Godname	Archangel	Order of Angels	Mundane Chakra
Kether	620	21	314	833	636
Chokmah	73	15, 26	331	187	140
Binah	67	50	311	282	317
Chesed	72	31	62	428	194
Geburah	216	36	131	630	95
Tiphareth	1081	76	101	140	640
Netzach	148	129	97	1260	64
Hod	15	153	311	112	48
Yesod	80	49	246	272	87
Malkuth	496	65, 155	280	351	168

The yod populations of the n-tree and n overlapping Trees of Life are:

$$\begin{array}{l} \mathbf{n-tree} \\ Y(n) = \mathbf{50n} + 30 \end{array}$$

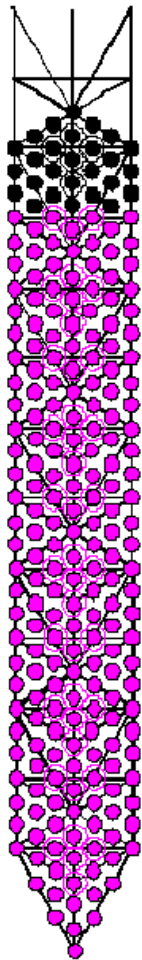
$$\begin{array}{l} \mathbf{n Trees of Life} \\ \tilde{Y}(n) = \mathbf{50n} + 20. \end{array}$$



**EQUIVALENCE OF ENCODINGS OF SUPERSTRING
 NUMBER 496 IN (7+7) POLYGONS AND IN 10
 OVERLAPPING TREES OF LIFE REPRESENTING
 10-DIMENSIONAL SPACE-TIME**

Figure 5

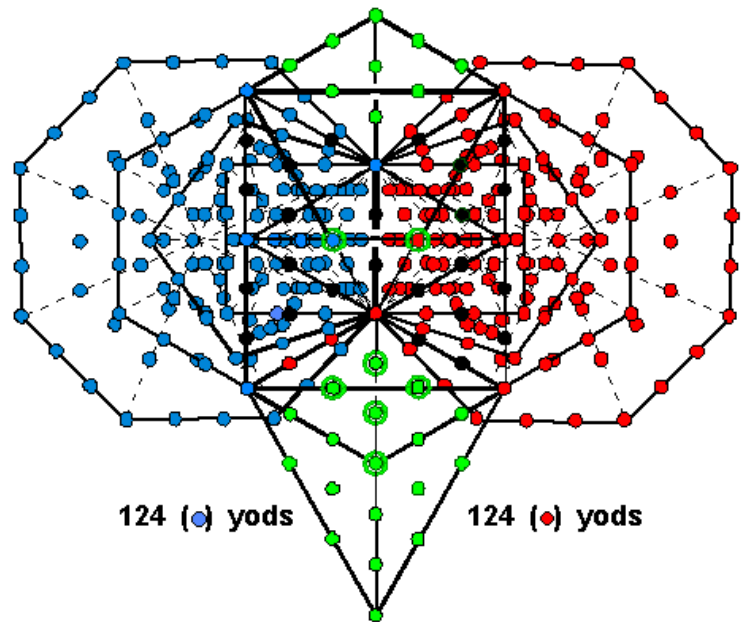
280 yods in 5-tree
 270 yods in 5 trees
 248 (●) yods



● = 1
 ● = 2

= 248 =

270 yods outside root edge in (5+5) enfolded polygons



124 (●) yods

124 (●) yods

26 (●) yods shared with Tree of Life

The 248 yods in the (5+5) enfolded, regular polygons which are unshared with the Tree of Life unless they are Sephirothic points denote the 248 gauge fields of the superstring symmetry group E_8 .

Figure 6

(Notice that they are determined by the number value **50** of Elohim, Godname of Binah

The 5-tree has ($Y(5) = 280$) yods, which is the number value of Sandalphon, Archangel of Malkuth, whilst five overlapping Trees of Life have ($\check{Y}(5) = 270$) yods — as many yods as $(5+5)$ enfolded polygons have outside their root edge. This compares with the fact that ten Trees of Life have 520 yods — as many yods as $(7+7)$ enfolded polygons have *outside* their root edge (*fig. 5*). The two sets of seven enfolded, regular polygons thus encode ten overlapping Trees of Life and a subset — the $(5+5)$ enfolded polygons — encodes five overlapping Trees of Life. The reason for this is as follows: of the 260 yods outside the root edge of each set of seven enfolded polygons, 13 are shared with paths of the Tree of Life, leaving 247 unshared yods, that is, 248 such yods in each set of polygons (see Figure 5). The $(248 + 248 = 496)$ yods in both sets of polygons unshared with Paths of the Tree of Life symbolise the $(248 + 248 = 496)$ gauge fields of the $E_8 \times E_8$ symmetry group associated with one of the five superstring theories. 12 of the 135 yods in the five enfolded polygons outside their root edge are shared with the Tree of Life, apart from the three Sephirothic points, leaving 123 other yods which are either unshared or Sephirothic points. Both sets of five polygons therefore have $(2 \times 123 = 246)$ such yods, where **246** is the number value of Gabriel, Archangel of Yesod (*fig. 6*). Two yods in the root edge are Sephirothic points, the other two being shared with the Tree of Life. The subset of polygons encodes the same number $(246 + 2 = 248)$ of such yods as the full set. This remarkable property arises because 248, the number of superstring gauge fields associated with E_8 , is a ‘cosmic parameter’ and must be embodied in *any* Tree of Life pattern — in this case the $(5+5)$ polygons prescribed by the ten Godnames. Furthermore, these 248 yods include eight Sephirothic points — the two endpoints of the root edge and the six Sephiroth on the side pillars. The 248 yods therefore comprise eight yods that are Sephirothic points and 240 yods that are entirely unshared. Compare this with the fact that the 248 simple roots of E_8 comprise eight of what mathematicians call ‘zero roots’ and 240 ‘non-zero roots.’ We see that the encoding in the subset of $(5+5)$ polygons of the dimension 248 of E_8 reproduces the 240:8 pattern of its root structure as well! The further 1:7 differentiation of the zero roots corresponds to the differentiation between the yod at Daath, the non-Sephirah, and the seven yods at the locations of the Sephiroth.

The list of properties given above for the $(5+5)$ enfolded polygons indicates that 240 is the number of yods inside them other than their 34 corners. In other words, the two sets of polygons possess 240 *hidden* degrees of freedom that manifest as *new* yods when the polygons are constructed from tetractyses. As a striking illustration of the status of these two sets of polygons as a Tree of Life pattern, the remarkable counterpart to this property in the Tree of Life itself is as follows: the

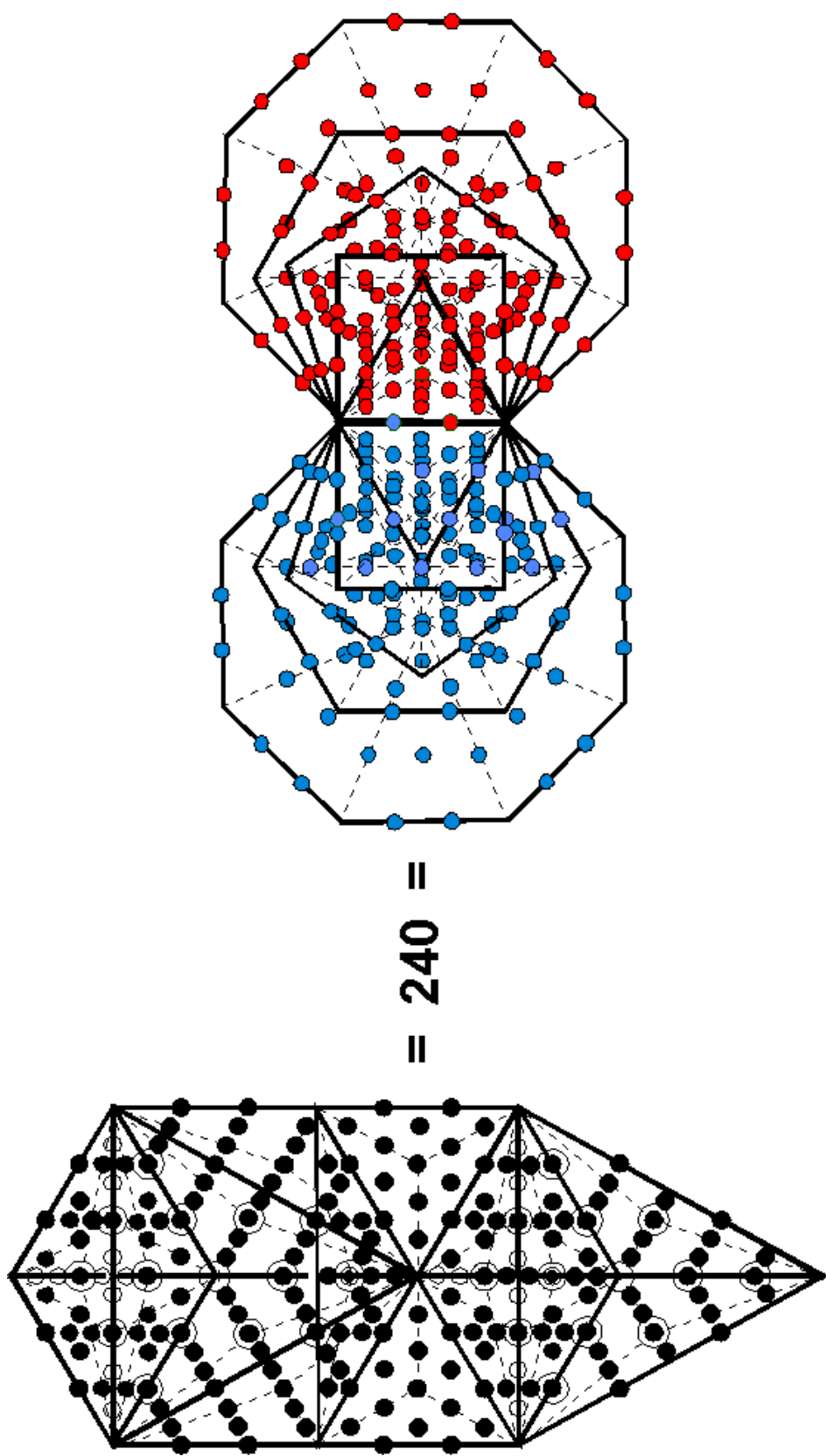


Figure 7. The 1-tree contains as many hidden yods (240) as the (5+5) enfolded polygons contain yods other than their corners.

1-tree is the lowest tree in the ‘Cosmic Tree of Life,’ which was described in previous articles as the 91 overlapping trees mapping *all* levels of reality, including the physical universe. When the 19

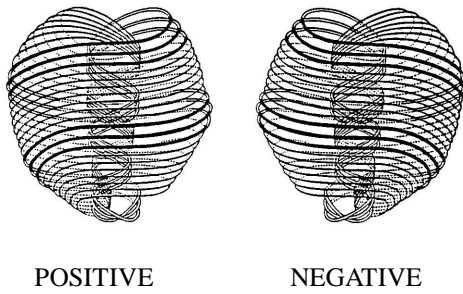


Figure 8. The two types of UPAs.

triangles of the 1-tree are divided into 57 triangular sectors and the latter are then transformed into tetractyses, 240 extra yods are generated by this transformation (*fig. 7*). In the case of the seven separate polygons, 240 is the number of their hexagonal yods. In previous articles and in his book *The Image of God in Matter* the author has given a physical interpretation of the association of this number with any Tree of Life pattern defined by Godnames: as

such a pattern, the ten-fold UPA or superstring exhibiting exact E_8 symmetry ‘contains’ 240 gauge

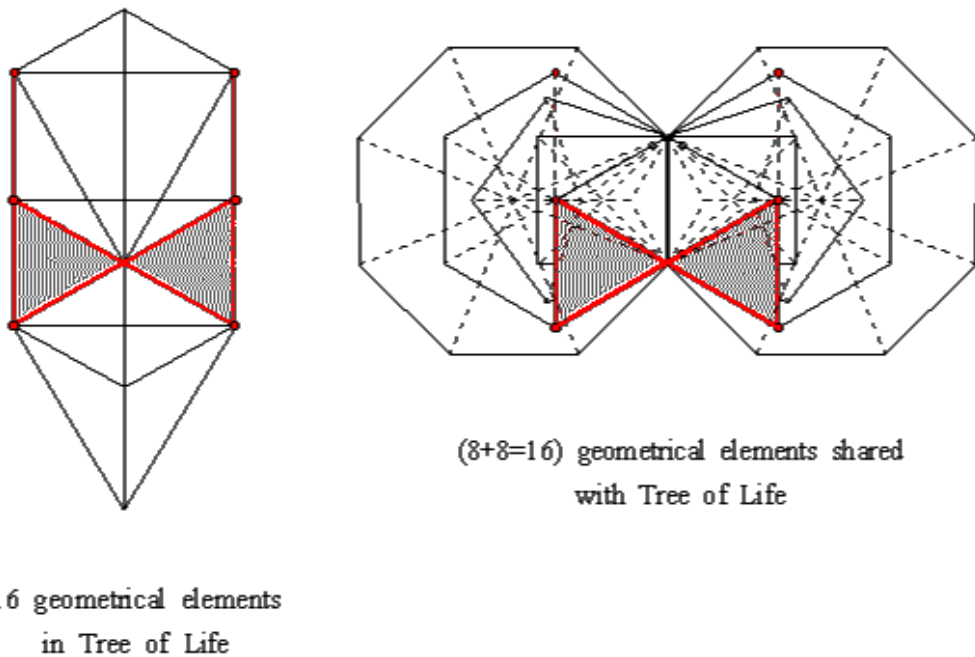


Figure 9. Of the 187 tetractyses and their corners and sides in the (5+5) enfolded polygons, 168 are unshared with the Tree of Life.

charges of the unified gauge symmetry group E_8 spread along its closed loops (*Fig. 8*), 24 per whorl/closed string. Because each string is 26-dimensional, 24 numbers or co-ordinate variables specify the amplitudes of transverse modes of oscillation of each string, making a total of $10 \times 24 = 240$ for the superstring as a whole (see Article 5 for more details). Each oscillation generates a gauge charge.

The (5+5) enfolded polygons comprise 185 corners, sides and tetractyses (see their properties listed earlier). Of the 184 outside their shared root edge, eight in each set of five polygons are shared with the Tree of Life (*fig. 9*), leaving $(184 - 16 = \mathbf{168})$ corners, sides and tetractyses of both sets which are unshared, that is, they represent *new* geometrical elements or degrees of freedom.

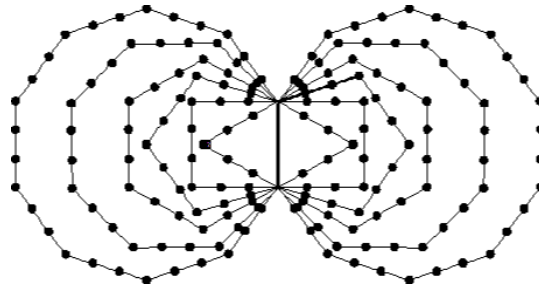


Figure 10. The (6+6) enfolded polygons have 168 yods on their boundaries.

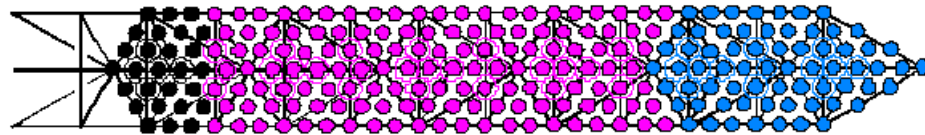
The appearance of this number as a property of the two sets of polygons confirms their status as a Tree of Life pattern embodying information about superstrings. As earlier articles pointed out, **168** is the number value of Cholem Yesodeth, which is the Mundane Chakra of Malkuth. More remarkably still, it is the kernel of 1680, the number of 1st-order spirillae, or helical coils, that C.W. Leadbeater counted in each of the ten closed curves of the UPA, identified by the author (5) as the superstring constituent of the up and down quarks making up protons and neutrons in atomic nuclei. This structural parameter of the superstring is therefore encoded in the two sets of five polygons as the *number of independent geometrical elements required to define them as a Tree of Life pattern*. It is a remarkable and beautiful property that 248 yods are required to generate from the root edge an object comprising **168** geometrical elements, thus relating the number of quantum states of the particles mediating the unified force between superstrings to what, essentially, string theorists would call the ‘winding number’ associated with the normal modes of vibration of a string in its ground state. The spirillae are the oscillations of circularly polarised waves running around each of the ten strings in the superstring.

Further evidence that the first (5+5) enfolded polygons constitute a Tree of Life pattern is as follows: the first four enfolded polygons contain 94 yods, of which 14 are shared with the Tree of Life. Hence they have $(94 - 14 = \mathbf{80})$ unshared yods. As there are 248 unshared yods in the first (5+5) enfolded polygons, there are $(248 - \mathbf{80} = \mathbf{168})$ unshared yods in one set of four polygons and in the pair of octagons. Article 8 proves that the first four polygons constitute a Tree of Life pattern encoding ‘cosmic parameters’ because the ten Godname numbers prescribes their geometrical properties, just as was found in previous articles for the (7+7) polygons, the (6+6) polygons (*fig. 10*) and the (7+5) polygons, all of which are such patterns. The division of yods:

270 yods in 5 trees

280 yods in 5-tree

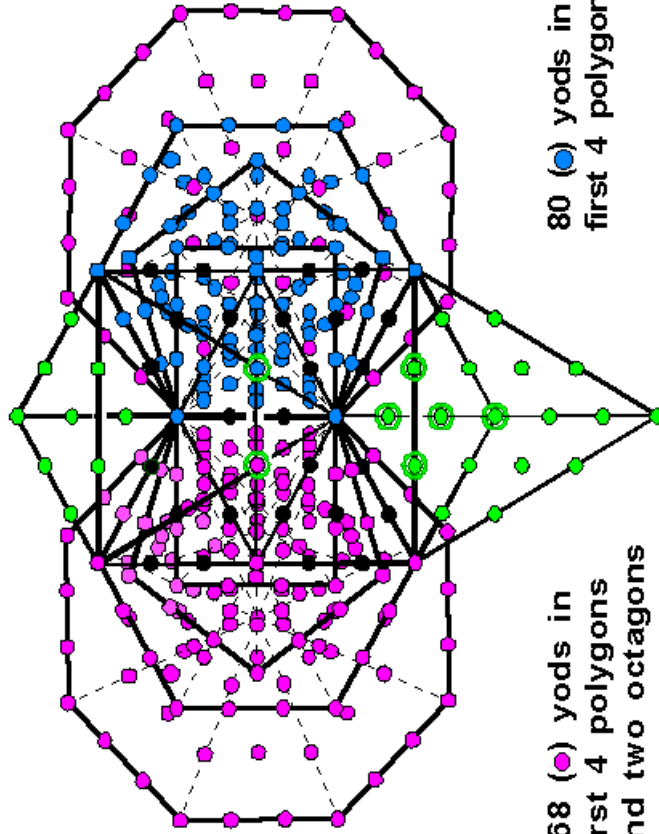
32 (●) yods
168 (●) yods
80 (●) yods



● = 1
● = 2

270 yods outside root edge of (5+5) enfolded polygons

26 (●) yods shared with Tree of Life not
Sephirothic points or centres of polygons



= 248 =

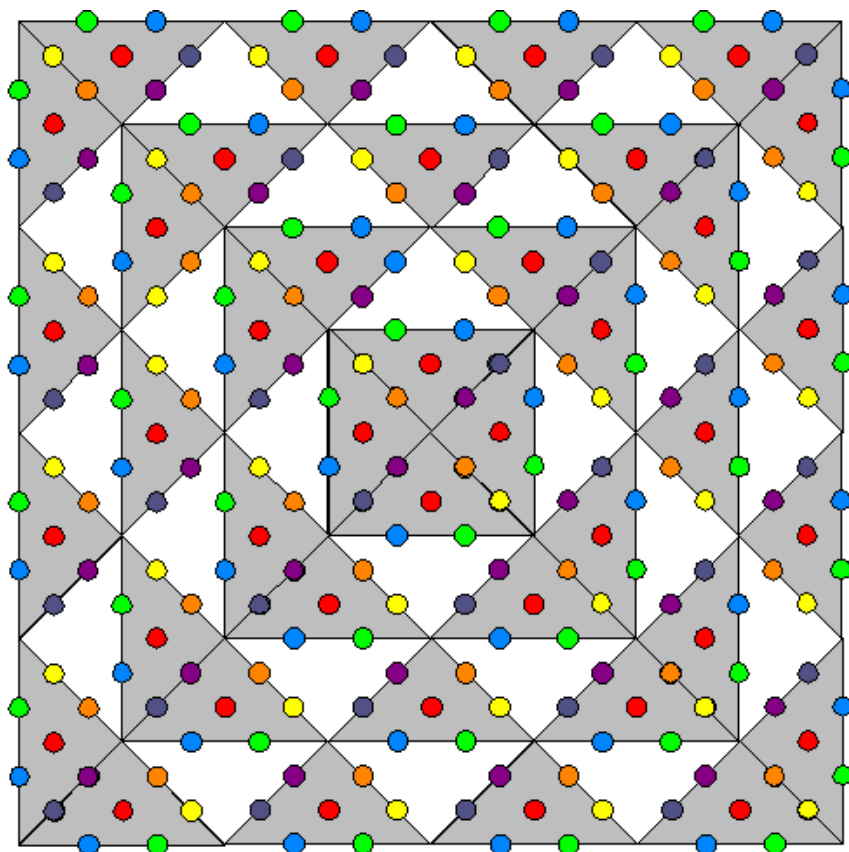
168 (●) yods in
first 4 polygons
and two octagons

80 (●) yods in
first 4 polygons

The 248 yods up to Chesed of the 5th tree comprise the 80 (●) yods of the 1-tree and the 168 (●) yods above it. These correspond to the 80 (●) yods in the first 4 polygons and the 168 (●) yods in the other set and in the two octagons. Of the 168 yods, 78 are in the first 4 polygons outside the root edge and 90 are in the two octagons outside the root edge. The (5+5) polygons encode the number value 168 of Cholem (= 78) Yesodeth (= 90), the Mundane Chakra of Malkuth.

Figure 11

248 =



The square, geometrical symbol of the number 4 (Pythagorean tetrad), with 2nd-order tetractyses as its sectors has 248 yods other than corners of 1st-order tetractyses surrounding its centre. The Godnames Ehyeh and Yah with number values, respectively, 21 and 15 prescribe this representation of the dimension 248 of the superstring gauge symmetry group E_8 because the four 2nd-order tetractyses have 41 corners ($41 = 21\text{st odd integer}$), each having 15 corners. The total number of yods surrounding the centre of the square = $288 = 1^1 + 2^2 + 3^3 + 4^4$.

THE SQUARE ENCODES THE DIMENSION 248 OF E_8

Figure 12

(fig. 12). The Pythagorean tetractys is but the first member ('1st-order tetractys') of an infinite set of tetractyses where each new member in the set is derived from the previous one by turning their yods into 1st-order tetractyses. The next member — the 2nd-order tetractys — has 85 yods, where

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

and **72** yods per sector of a square. Of the latter, **62** are hexagonal yods (see Figure 12), so that the square contains ($4 \times 62 = 248$) hexagonal yods. An ancient symbol of the four elements of Earth, Water, Air and Fire, the square actually embodies the number of quantum states of the messenger particle transmitting the unified force between superstrings — the force which shapes the very matter of the universe and determines what properties it has!

The simultaneous conjunction of several numbers of significance to superstring theory (albeit including one which awaits the future discovery of constituents of quarks) refutes the argument that a sceptic might make, namely, either the 'right' number appeared just by chance or some otherwise ad hoc selection of polygons has been made in order to procure the required numbers. Firstly, the choice of geometrical objects is not free but is restricted severely by their having to be prescribed by ten Godname numbers. Secondly, the likelihood of numbers like **168** and 248 appearing together by chance in such a set of objects — sometimes (as here) in the *selfsame* context — is extremely implausible, given the small number of properties (a dozen or so) which are listed for them and in which these two numbers would have had to occur fortuitously. Boldface numbers indicating a Kabbalistic significance manifest in discussions of properties of Tree of Life patterns like the (7+7) polygons, the (7+5) polygons, the (6+6) polygons and the (5+5) polygons too often to be generated randomly by chance. Such frequency displays not the kind of chaos of the roulette wheel but, instead, the presence of conceptual order and regularity in the cosmic blueprint of the Tree of Life. The latter is like a hologram in which the *same* information is encoded in different but equivalent sections. What is so extraordinary and inexplicable to scientific materialism is that the numbers quantifying this information link discoveries in particle physics with both an ancient Hebrew, mystical tradition and purported paranormal descriptions of subatomic particles published over a century ago!

5. CONCLUSION

This article has extended the analysis in previous articles of various subsets of the seven and (7+7) enfolded, regular polygons that constitute the inner form of the Tree of Life. Properties of the new subset — the first five and (5+5) enfolded polygons — were shown to be prescribed by the

number values of the ten Hebrew Godnames. In confirmation of their status as a Tree of Life pattern embodying numbers of cosmic significance, these polygons were shown to contain:

1. 248 yods other than polygonal corners when their sectors are turned into tetractyses, that is, 248 degrees of freedom *hidden* within their shapes. These symbolise the 248 gauge fields of E_8 , the gauge symmetry group of the unified force between superstrings;
2. **168** geometrical elements outside their common edge that are unshared with the outer form of the Tree of Life. Apart from a Tree of Life factor of 10 whose scientific meaning will not be elucidated here, these represent the number of oscillations of the circularly polarised waves running around each closed string component of a superstring constituent of up and down quarks, as observed by C.W. Leadbeater over a century ago with the yogic siddhi called ‘anima.’

It was argued that coincidence cannot plausibly explain the presence in the *same* geometrical object of two numbers that have been shown in previous articles to be connected with superstring dynamics and structure and to quantify other Tree of Life patterns *independently* defined by Godname numbers. The repetition of such fundamental numbers represents, instead, different levels of encoding in the Tree of Life of the *same* basic information about its microphysical manifestation — the superstring.

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