The Meaning of Nolan's Cross — a Preliminary Summary

by

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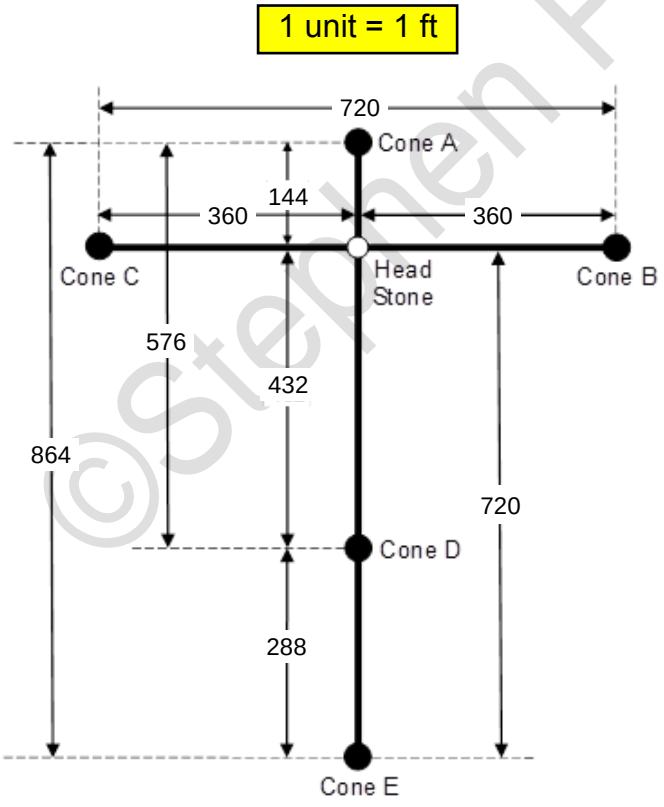
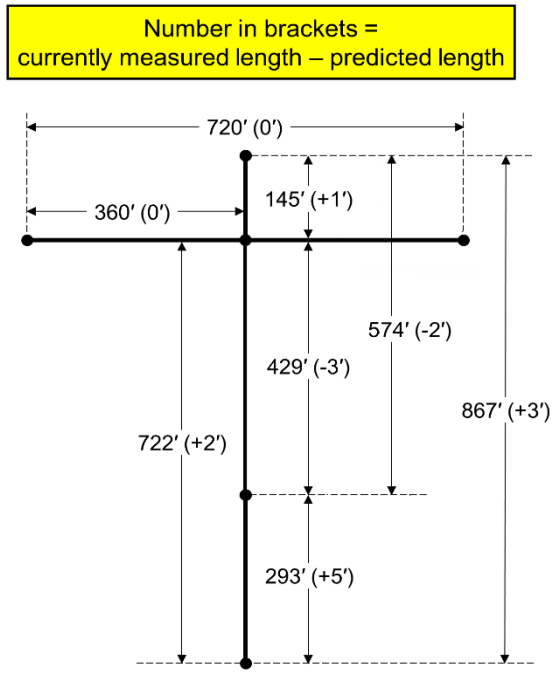
May 13, 2021

This is intended not as a complete article but as a list of research results intended for quick publication on the internet for those already familiar with the topic. A more balanced report for the general reader will be issued later. Anyone who is no longer mesmerised by the prospect of finding treasure hidden at a location encoded in the simple geometry of Nolan's Cross and who realises that the various distances between its stone markers — not its shape — are what is really significant is advised to study the research the author has published on his website in order to acquire the conceptual framework needed to understand its profound meaning. It is recommended that readers revisit this article because material continues at present to be added to it. An announcement will be made in due course about an extraordinary, mathematical similarity that the author has discovered between this stone formation and the world-famous Gate of the Sun at Tiwanaku in Bolivia. It will occur after the release of his book, which deciphers the meaning of the bas-relief that is carved on its lintel and depicts the creator God Viracocha and his angels.



Predicted measurements of Nolan's Cross

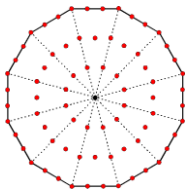


Nolan's Cross measurements

Actual measurements of Nolan's Cross

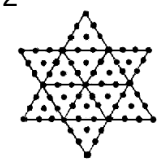
Contents

Fig. 1



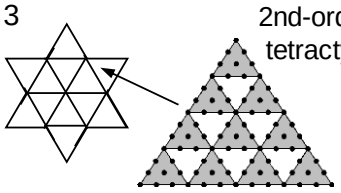
72 yods surround the centre of the Type A dodecagon (the 10th polygon).

Fig. 2



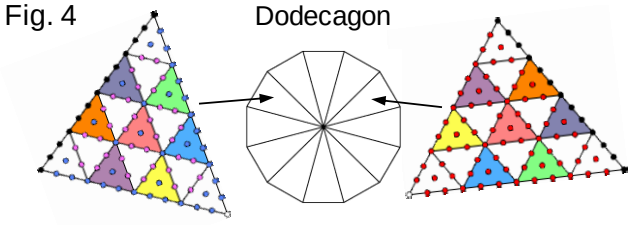
72 yods surround the centre of a hexagram constructed from 1st-order tetractyses.

Fig. 3



864 (=12×72) yods surround the centre of a hexagram constructed from 2nd-order tetractyses.

Fig. 4



288 ● → 4×72
432 ● → 6×72
720

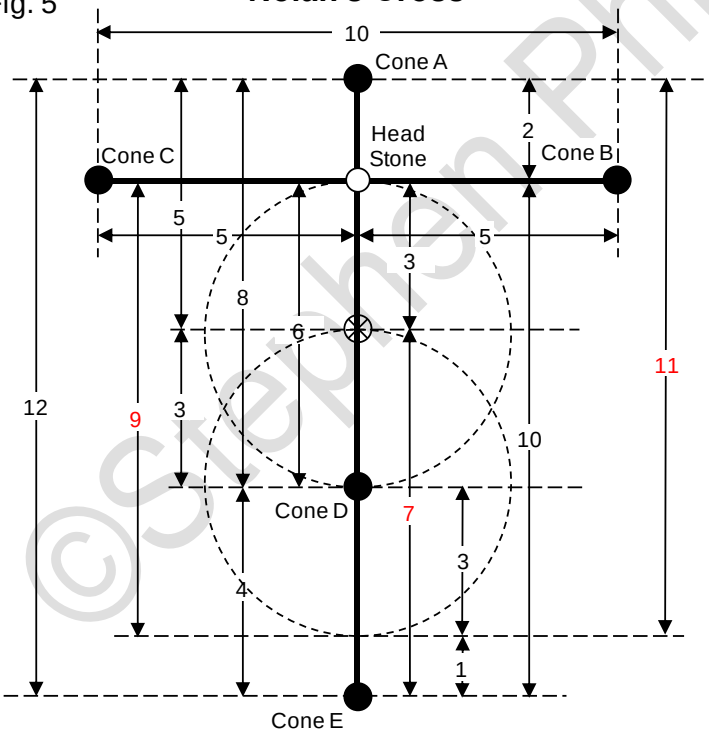
144 ● → 2×72
720 ● → 10×72
864

Number of (●) yods on sides of dodecagon = 12×12 = 144 = 2×72.
Number of (●) yods inside dodecagon = 12×60 = 720 = 10×72.
Total number of yods = 864 = (2+10)×72.
Number of (●) yods at centres or corners of 120 tetractyses or on the interior sides of 12 sectors = 12×24 = 288 = 4×72.
Number of (●) hexagonal yods inside 12 sectors on sides of tetractyses= 12×36 = 432 = 6×72.

The 2:10 division in the vertical line of the cross corresponds to the distinction between boundary yods (●) and (●) yods inside the dodecagon with 2nd-order tetractyses as sectors. The 4:6 division created by Cone D in the section of the vertical line below the horizontal line corresponds to the distinction between (●) and (●) yods in the dodecagon.

Fig. 5

Nolan's Cross



1 unit = 72 feet

$6\times72 = 432 = 3^3 + 4^3 + 5^3 + 6^3$.

$3\times72 = 216 = 3^3 + 4^3 + 5^3 = 6^3$.

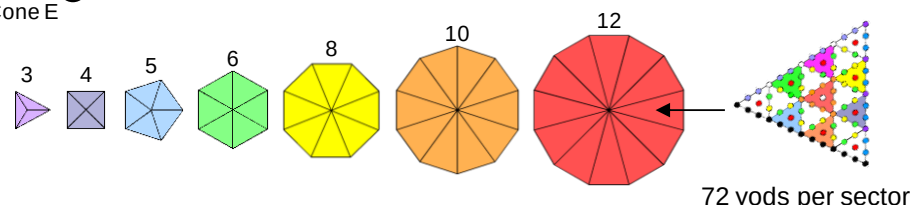
<u>Sephirothic patterns in the outer Tree of Life</u>

10 = 5 + 5
= 1 + 9
= 1 + 3 + 3 + 3
= 4 + 6
= 3 + 7.

(Numbers in red are the numbers of corners of the three polygons absent from the inner Tree of Life)

Number of yods surrounding centre of n-sided polygon = 72n.

Fig. 6
7 polygons of inner Tree of Life



Number of yods surrounding centre = 216 288 360 432 576 720 864

1. Nolan's Cross distances reduced to the integers 1-12

The numbers 864, 720, 576, 432, 360, 288 & 144 are lengths in feet of different sections of Nolan's Cross marked out by its five "Cones" (A, B, C, D, & E) and the intersection of its vertical and horizontal arms, a point which is marked by the so-called "Head Stone." Their largest common factor is 72, which is well-known to Kabbalists as the number of Names of God. It is also the gematria number value of *Chesed* (חסד), the first of the seven Sephiroth of Construction. Their polygonal counterparts in the inner form of the Tree of Life (*Etz Chayim*) are the two mirror-image sets of seven enfolded, regular polygons: the triangle, square, pentagon, hexagon, octagon, decagon & dodecagon (see Fig. 6). The centre of the dodecagon is surrounded by 72 yods when its 12 sectors are tetractyses (Fig. 1). The ancient symbol of the hexagram also has 72 yods surrounding its centre when its 12 triangles are tetractyses (Fig. 2). The tetractys is the 1st-order tetractys, for it is but the first member of an infinite sequences of higher-order tetractyses generated by successive replacements of yods by 1st-order tetractyses. Replacing its 10 yods by 10 1st-order tetractyses generates the 2nd-order tetractys (Fig. 3). It has 85 yods, where

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

Lining each of its three sides are 13 yods, so that 36 yods lie on its boundary, inside which are 49 yods, 48 yods surrounding its centre. This means that the number of yods surrounding the centre of the 2nd-order tetractys is 84, where

$$84 = 36 + 48 = 1^2 + 3^2 + 5^2 + 7^2.$$

It is now proved that 864 yods surround the centre of a hexagram whose 12 triangles are 2nd-order tetractyses. Suppose that the n sectors of an n-sided polygon are turned into 2nd-order tetractyses. As 13 yods line each interior side, there are (85−13=72) yods per sector. The number of yods surrounding the centre of the polygon = 72n. A hexagon (n=6) has (72×6=432) such yods and a dodecagon (n=12) has (72×12=864) yods. The 2nd-order tetractys has (85−13=72) yods above its base, so that (6×72=432) yods are in its six triangular points, making a total of (432+432=864) yods. The vertical length of Nolan's Cross is 864 ft. The number of yods surrounding a similarly constructed pentagram is (10×72=720), comparing with the arm of the cross being 720 ft wide. Constructed from 2nd-order tetractyses, these two ancient, religious symbols therefore measure the height and width of Nolan's Cross.

Twelve yods per side lie on the boundary of a polygon. For a dodecagon, (12×12=144 =2×72) yods line its sides and 720 (=10×72) yods are inside it (Fig. 4). Compare this with the sections of the vertical line above and below the arm of the cross: respectively, 144 ft and 720 ft. The boundary of the dodecagon divides its yod population in the ratio 2:10 just as the arm of the cross divides its vertical length in the same ratio. Moreover, 36 yods line the sides of a 2nd-order tetractys, so that, of the (85−36=49) yods inside its boundary, 10 are centres of 1st-order tetractyses and three are corners, leaving 36 hexagonal yods, whilst 24 yods either are centres and corners or line internal sides of sectors. The dodecagon constructed from 2nd-order tetractyses has (12×36=432=6×72) internal hexagonal yods and (12×24=288=4×72) centres & internal corners. This 6:4 division corresponds to the lengths 432 ft and 288 ft of the two sections marked out by cone D. *The dodecagon is the polygonal counterpart of the vertical line divided into sections of 2, 6 & 4 units of 72 ft.*

By choosing the unit of length as 72 ft, the lengths of the various sections of Nolan's Cross can be reduced to the integers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 & 12 (Fig. 5). Cone D is 432 ft (6 units) from the arm of the cross, where

$$432 = 3^3 + 4^3 + 5^3 + 6^3.$$

The midway point of this section (denoted in Fig. 5 by ⊗) is 216 ft (3 units) from Cone D, where $216 = 6^3 = 3^3 + 4^3 + 5^3$. This is the number of yods that surround the centre of a triangle whose sectors are 2nd-order tetractyses: 216 = 3×72. In fact, the integers 3, 4, 5, 6, 8, 10 & 12 denote the numbers of corners of the seven regular polygons making up each half of the inner Tree of Life (Fig. 6). Every polygon has a yod population that is equal to the length in feet of one of the sections of the cross. The remaining integers 7, 9 & 11 written in red correspond to the heptagon, nonagon & undecagon — the three polygons that are absent from the inner form of the Tree of Life. They denote lengths that are *implicit* in the proportions of the cross marked out by the two dashed-line circles forming a *Vesica Piscis*, not lengths marked out by the Cones. These three polygons are analysed in Article 58 & Article 59 at the author's website.

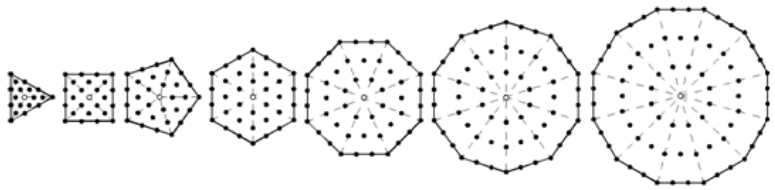
In units of length of 72 ft, the total distance between the Cones is 22. There are five possible combinations of integers that measure this number of corners of polygons making up the inner Tree of Life:

1. 3 + 4 + 5 + 10; 2. 3 + 5 + 6 + 8; 3. 4 + 6 + 12; 4. 4 + 8 + 10; 5. 10 + 12.

Only the fourth possibility reproduces the sections marked out only by Cones. The last one corresponds to the entire horizontal and vertical lines without any division marked out by Cone D or the Head Stone.

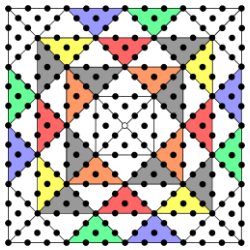
Type A n-gon has 6n yods
Type B n-gon has 15n yods

7 Type A polygons



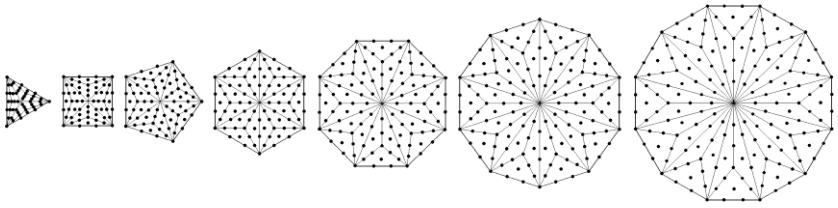
n = 3 4 5 6 8 10 12

288 yods → 4 units



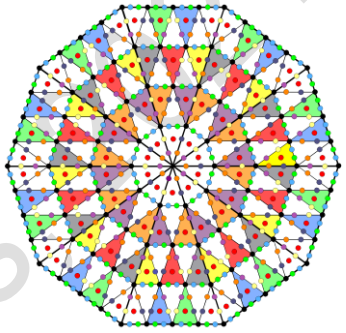
The square has 288 yods

7 Type B polygons



n = 3 4 5 6 8 10 12

720 yods → 10 units



The decagon has 720 yods

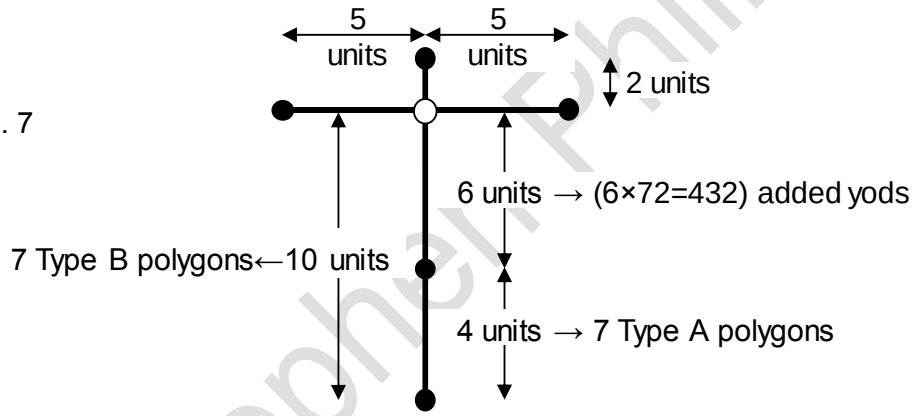


Fig. 7

1 unit = 72 feet

Type B

5 units ← 360 yods { Triangle, Square, Pentagon, Dodecagon } 24 corners

{ Hexagon, Octagon, Decagon } 24 corners → 360 yods → 5 units

The two straight lines 10 units long symbolise the two halves of the inner Tree of Life, each being a set of 7 regular Type B polygons with 720 yods. The 720 yods in each set of 7 Type B polygons comprise the 288 yods in the 7 Type A polygons and an extra 432 yods. This divides the vertical line 10 units long into a section 4 units long and a section 6 units long.
The division by the vertical line of the horizontal line 10 units long into two halves 5 units long symbolises the two "halves" of the 7 separate Type B polygons, each half having 360 yods representing 5 units.

2. Inner Tree of Life basis of the divisions of the vertical & horizontal arms

The number 4 is symbolised by the square and the number 10 is symbolised by the decagon. The former has (4×72=288) yods surrounding its centre when its sectors are 2nd-order tetractyses (Fig. 7), where

$$288 = 1^1 + 2^2 + 3^3 + 4^4.$$

The number 72 chosen as the unit of length in feet is the arithmetic mean of the first *four* integers raised to their own powers:

$$72 = 288/4 = (1^1 + 2^2 + 3^3 + 4^4)/4.$$

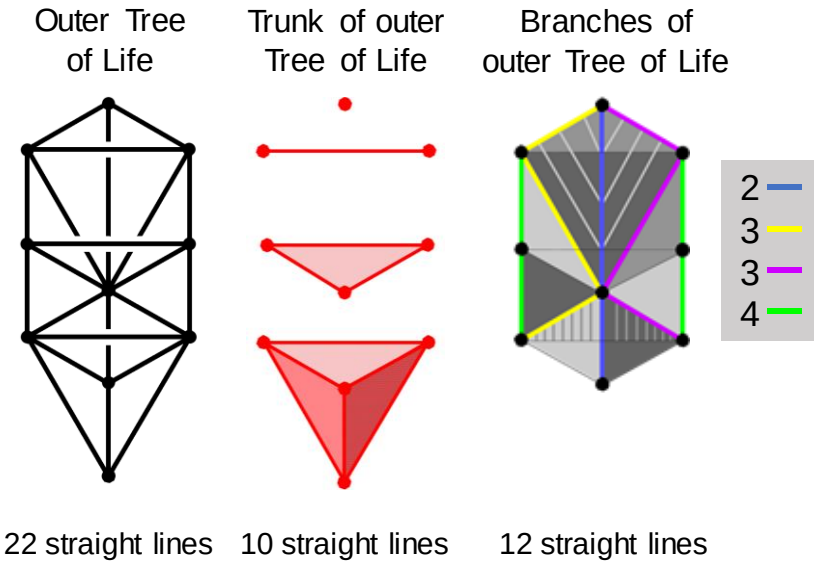
The distance between Cone D and Cone E is 288 ft, so that it is represented by the square. The distance between Cone A and Cone D is eight units (576 ft), so that it is represented by the octagon. The decagon with 720 yods surrounding its centre corresponds to the length 720 ft of the horizontal line between Cones B and C. When the seven types of polygons in the inner Tree of Life are Type A, the number of yods surrounding their centres = $\sum 6n = 6\sum n$ = 6×48 = 288. When they are Type B, the number of yods surrounding their centres = $\sum 15n$ = 15$\sum n$ = 15×48 = 720. This is the length in feet of the section of the vertical line below the horizontal line. The distance (432 ft, or six units) of cone D below the latter corresponds to the (9×48=432=6×72) extra yods (corresponding to six units) in the seven Type B polygons. The horizontal and vertical lengths below the arm of the cross *have* to be the same because their lengths of 720 ft measure the 720 yods in each half of the inner the Tree of Life; they contain the same set of polygons, albeit one set is the mirror image of the other. Cone D cannot be midway along the vertical section up to the horizontal arms because this type of division into two equal halves is already expressed by the vertical arm itself. Instead, it quantifies the transformation of all seven Type A polygons into Type B polygons. It marks as distance measured in feet how many more yods the transformation requires. This is nine yods per sector, compared with the six yods for a Type A polygon. The fractional increase is 9/6 = 3/2, which is the ratio 6/4 of the distances between Cone D and the Head Stone and between Cone D and Cone E (see Fig. 7).

The geometry of the inner Tree of Life — indeed, the geometry of each polygon — has the same property when Type A and Type B polygons are considered. The number of geometrical elements (i.e., points, lines & triangles) surrounding the centre of an n-gon is 4n for Type A and 10n for Type B. The latter has 6n more geometrical elements than the former, so that the seven Type B regular polygons with 48 corners making up each half of the inner Tree of Life have (6×48=288) more geometrical elements when Type B than when Type A with (4×48=192) geometrical elements. The ratio 288/192 = 3/2. Cone D correctly marks in terms of distance the distinction between Type A and Type B polygons whether their yod or their geometrical compositions are being represented, although the lengths of the arms of the cross and the vertical section below them (720 ft) express the identical yod populations (720) of each half of the inner Tree of Life. The ratio of the numbers of yods and geometrical elements surrounding the centre of the nth-order m-gon is 3/2, *whatever n and m are* (for proof, see Table 9 on p. 5 of Article 65 at the author's website at www.smphillips.mysite.com). Remarkably, 3/2 is the ratio of the yod and geometrical element populations of the seven enfolded, nth-order polygons, *whatever n* is (see pp. 7-8 of Article 65). It is also the asymptotic limit of the ratio of the two populations of the (7+7) enfolded polygons in the limit $n \to \infty$ (see p. 9). Whether or not the designers of Nolan's Cross were aware of these mathematical facts, the 6:4 division by Cone D of what we shall later see corresponds to the *trunk* of the Tree of Life is significant.

The 48 corners of the seven separate polygons of the inner Tree of Life can be divided in several ways into two subsets, each of which has polygons with a total of 24 corners. The division:

triangle, square, pentagon, dodecagon hexagon, octagon, decagon

Is of special interest because the properties of each subset are similar even after they have become enfolded. When they consist of Type B polygons, each subset has (24×15=360) yods surrounding their centres. As 360 = 5×72, they correspond to a section of line that is five units long (360 ft). This is the length of each arm of the cross. Its vertical arm *must* divide the horizontal line exactly in half not because of the trivial fact that Christian crosses always have arms of the same length but because the horizontal line of Nolan's Cross represent one half of the inner Tree of Life (720 feet compared with 720 yods), which exhibits the property of possessing two polygonal halves with similar, quantitative properties (see Article 64 at the author's website). Moreover, the length of the vertical line below the arms *must* be the same as the length of the horizontal line because the two lines represent the two halves of the inner Tree of Life, each consisting of similar sets of seven Type B polygons with 720 yods surrounding their centres. By placing the Head Stone in the middle of the horizontal line of length 720 ft between Cone B and Cone C, but Cone D at a different point in the vertical, 720 ft section between the Head Stone and Cone E, the designers of Nolan's Cross were indicating that the archetypal whole that it represents can be divided into equal parts according to its intrinsic structure and that each half can be divided again either into two equal parts or two unequal parts, depending upon what level of mathematical transformation is imposed.



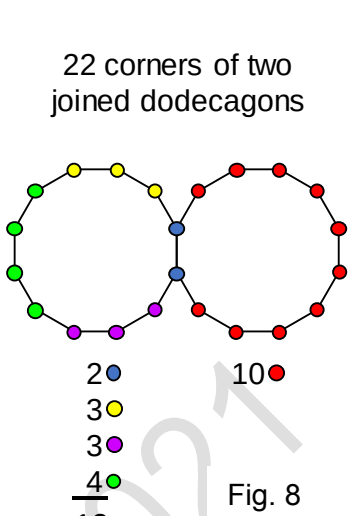
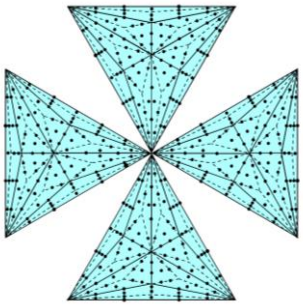
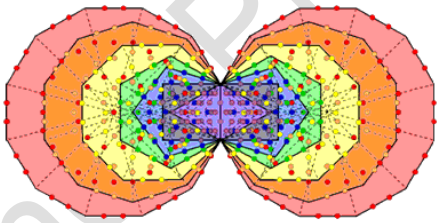


Fig. 8

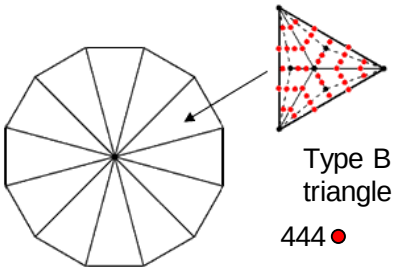
The 10:12 division in the lengths of the horizontal and vertical lines of Nolan's Cross correspond to the 10 lines of the trunk of the Tree of Life and the 12 lines of its branches. The latter comprises two central, vertical lines forming part of the Pillar of Equilibrium and 10 other lines. This corresponds to the 2:10 split in the vertical line of the Cross generated by its horizontal line. The four classes of lines have 2, 3, 3 & 4 members. They correspond to the vertical line of Nolan's Cross having four sections of length 2, 3, 3 & 4 units. The same 10:12 division appears in the two joined dodecagons as the 10 corners outside the root edge of one dodecagon and the 12 corners of the other one. This is because it is the polygonal counterpart of the Tree of Life.



The cross pattèe has 444 yods in its Type C triangular arms

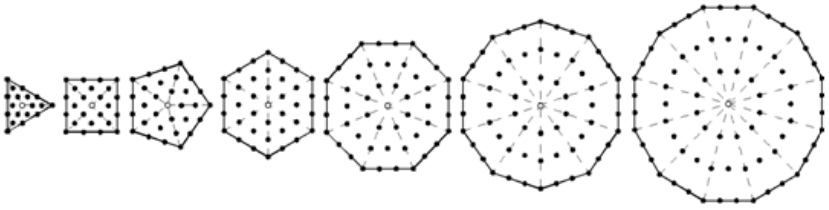


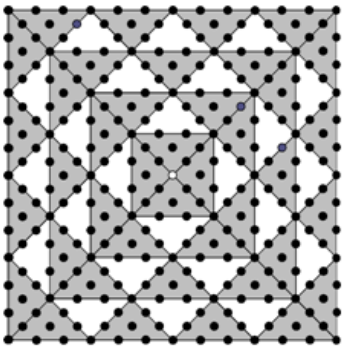
The (7+7) enfolded Type A polygons have 444 hexagonal yods



The Type C dodecagon has 444 hexagonal yods

Fig. 9





288 yods surround the centres of both the seven Type A polygons and the square with 2nd-order tetractyses as its sectors

3. Outer Tree of Life basis of the 10:12 division of lengths

The outer Tree of Life consists of 16 triangles with 10 corners and 22 sides — a total of 48 points, lines & triangles, or geometrical elements. Its trunk (Fig. 8) is the sequence of the first four simplices:

Trunk

Simplex	Point	Line segment	Triangle	Tetrahedron	Total
0-simplex (point)	1	0	0	0	1
1-simplex (line segment)	2	1	0	0	3
2-simplex triangle)	3	3	1	0	7
3-simplex (tetrahedron)	4	6	4	1	15
Total	10	10	5	1	26

It comprises 26 0-, 1-, 2- & 3-simplices, i.e., 25 points, line & triangles (10 points, 10 lines & 5 triangles). The branches of the outer Tree comprise no points and 23 lines & triangles:

Branches

Point	Line segment	Triangle	Tetrahedron	Total
0	12	11	0	23

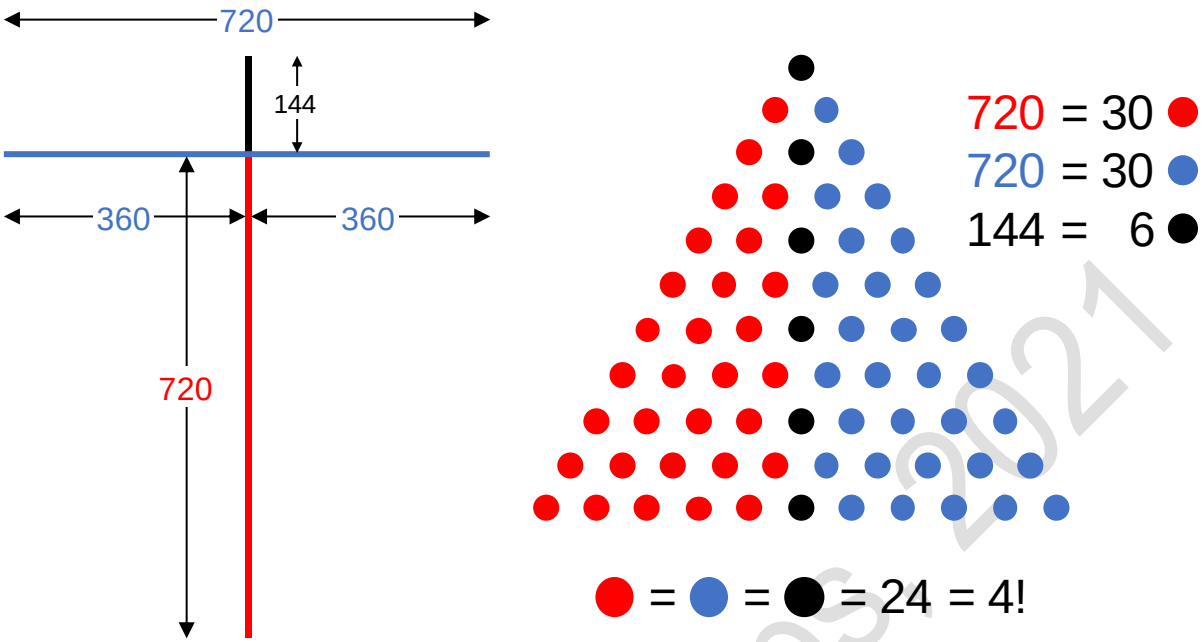
The 10:12 division of lines in the trunk and branches reminds us of the 10:12 ratio in the lengths of the horizontal and vertical lines of Nolan's Cross. It confirms that the natural unit of length must be 72 ft in order that the *same* integers 10 and 12 appear in their absolute measurements, as well as in their relative proportions, which would be the same whatever units of length were used.

The same division exists in the two joined dodecagons — the last of the seven types of polygons making up the inner Tree of Life. They have 22 corners, of which 10 are intrinsic to each dodecagon and two are shared. The 12 Paths in the branches consist of four vertical (green), one pair being the mirror image of the other with the vertical Pillar of Equilibrium as the mirror, three inclined violet lines and their mirror image — three yellow lines, and two blue lines aligned with the central Pillar. This 4:3:3:2 pattern appears in the vertical line of Nolan's Cross as the four units of length between Cones E and D, the three units between Cone D and the point ⊗, the three units between ⊗ and the Head Stone and the two units of length above the latter to Cone A (see Fig. 5). This correlation confirms the view that the horizontal line corresponds to the trunk of the Tree of Life and that the vertical line corresponds to its branches.

The 22 corners of the two joined dodecagons symbolise the 22 Paths of the outer Tree of Life. In fact, they also embody structural parameters of the outer & inner Trees of Life. For example, the 36 yods on the sides of a dodecagon (12 corners & 24 hexagonal yods) correspond to the 36 corners of each set of seven enfolded polygons (12 corners of the dodecagon and 24 corners intrinsic to the first six polygons). The Type A dodecagon has 60 hexagonal yods that correspond to the 60 hexagonal yods in the outer Tree. The Type C dodecagon has Type B triangles as its sectors. It contains 444 hexagonal yods, which is the same as the number of hexagonal yods in the inner Tree of Life with Type A polygons (Fig. 9). As a Tree of Life parameter, the number 444 is the number of hexagonal yods in the cross pattèe when its triangular arms are Type C triangles.

We have seen (see Fig. 4 and its comments) that the dodecagon with 2nd-order tetractyses as its sectors contains 864 yods, comparing with the length of 864 ft for the vertical line of Nolan's Cross. This is 288 yards, comparing with the 288 yods that surround the centres of the seven Type A polygons of the inner Tree of Life, as well as the centre of a square with 2nd-order tetractyses as its sectors. The distance in feet between Cones E and D is 288, whilst the distance between Cone D and the horizontal line is 432 ft. The latter is equal to the extra number of yods needed to turn the seven Type A polygons into Type B polygons with 720 yods surrounding their centres. A Type A n-gon has 6n yods and a Type B n-gon has 15n yods — an extra 9n yods. The ratio 9n/6n = 3/2, and this manifests in the ratio 432/288, which is 3/2. In other words, Cone D marks the transition between Type A and Type B polygons making up the inner Tree of Life whose two halves with 720 yods correspond to the vertical and horizontal sections of length 720 ft. The builders of Nolan's Cross had no choice where they placed Cone D, once they had planted Cone E at the same distance below the horizontal line between Cones B & C as that between them. It had to be the same because the two lines represent the two halves of the inner Tree of Life, each half being a set of the same types of polygons, although the mirror image of the other, and therefore containing the same number of yods when constructed from the Pythagorean building block of the tetractys.

Fig. 10



720 + 720 + 144 = 1584 = 66×24,

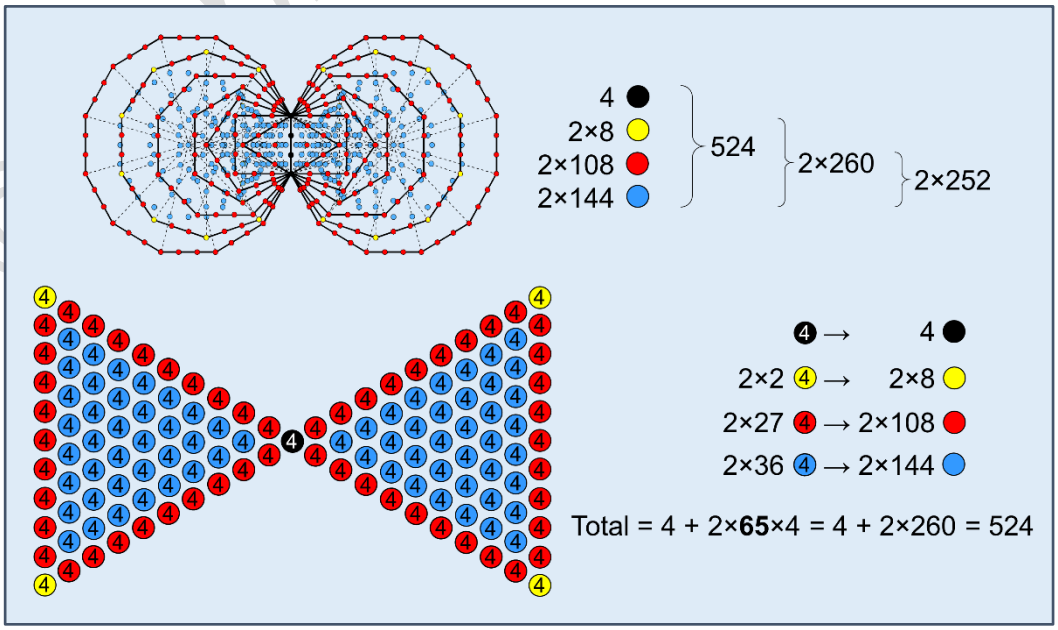
where

66 = 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11

15 15 30

360 144 360 720

Fig. 11



4. Nolan's Cross as the 11th triangular number

In terms of the unit of length of 72 ft, the total length of the two lines making up Nolan's Cross = 10×72 + 12×72 = 22×72 = 1584. The number 22 is the number of Paths in the Tree of Life. Assigning to each Path the Kabbalistic number (72) of the "Names of God" (also the gematria number of *Chesed* (חסד), the fourth Sephirah) generates the number 1584. As 1584 = 22×72 = 22×24×3, this length is 22×24 (=528) yards. As

$$22\times24 = 23^2 - 1 = 3 + 5 + 7 + \ldots + 45,$$

528 is the sum of the first 22 odd integers after 1. Because it can be regarded as the sum of these odd integers assigned to the 22 Paths, the number 528 has a special Kabbalistic significance. It can also be expressed by the set of integers 1, 2, 3 & 4 that are symbolised by the four rows of dots in the Pythagorean tetractys:

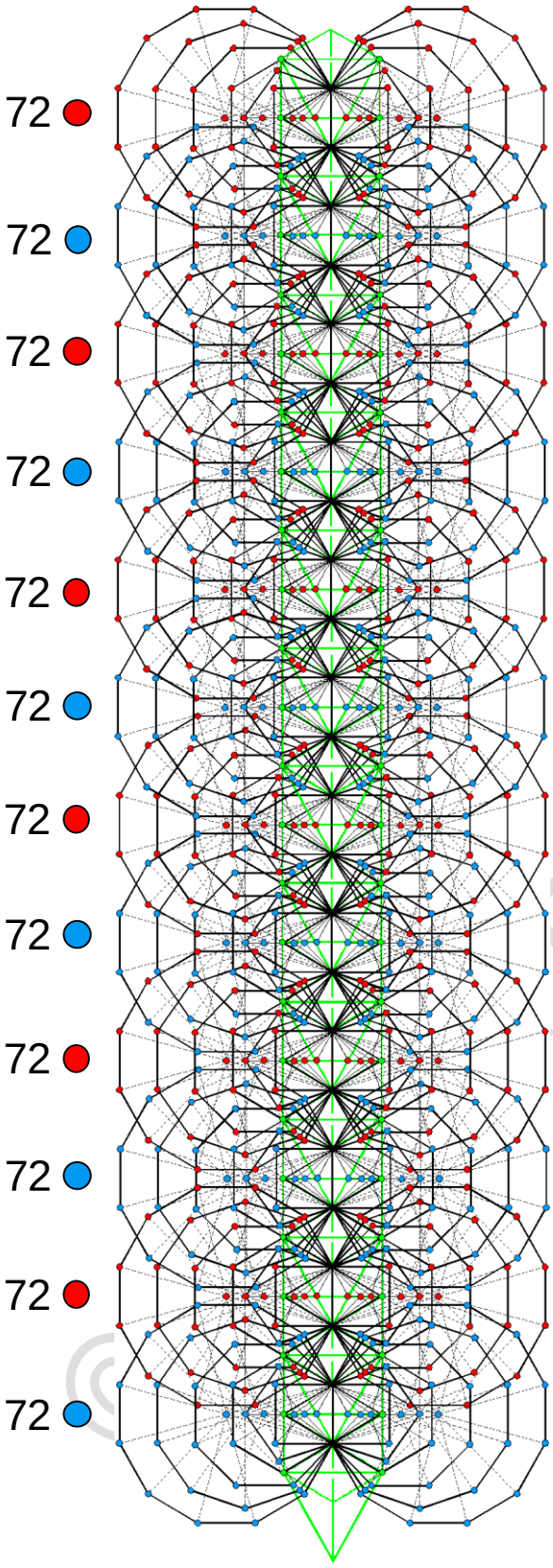
$$528 = (1^4 + 2^3 + 3^2 + 4^1)\times1\times2\times3\times4.$$

As 1584 = 22×3×24 = 66×4!, and

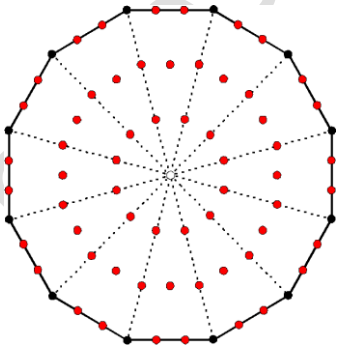
$$66 = 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11$$

is the eleventh triangular number, i.e., the *tenth* triangular number after 1 (the first triangular number), a triangular array of 66 integers, all 24 (=4!), generates the length of the two lines making Nolan's Cross (Fig. 10). Its central axis comprises six 4!s that sum to 144 — the length of the black line above the Head Stone marking the middle of the horizontal line. The sum of the 30 4!s on each side is 720, which is the length of the horizonal line (the distance between Cone B & Cone C) and the length of the vertical line below it (the distance between the Head Stone and Cone E). The factorisation of 1584 as 66×24 reveals that these measurements reflect the arithmetic property of the number 66 as a triangular number. The first five integers add up to 15, which generates the number 360 as the length of one arm of the cross. The sixth integer 6 generates the number 144 as the length of the vertical line above these arms, the seventh and eight integers sum to 15, which generates the number 360 as the length of the second arm, and the last three integers add up to 30, which generates the length of the vertical line below both arms. Here, therefore, are both geometric and arithmetic counterparts of the number 1584 embodied in Nolan's Cross.

What is the significance of the eleventh triangular number, given that it is the 33rd even integer? As the number of yods in the seven enfolded Type A polygons of the inner Tree of Life = 264 = 66×4, assigning the Pythagorean Tetrad to each dot in a triangular array of 66 dots generates this yod population (Fig. 11). The integer 4 at one apex signifies the four yods in the root edge and the 65 integers making up the triangular array add up to 260, which is the number of yods outside the root edge. Moreover, the sum of the 30 integers lining the array is 120 (the sum of the first *ten* odd integers after 1), whilst the sum of the 36 internal integers is 144, which is 12^2, where 12 is the number of corners of the dodecagon, the *tenth* regular polygon. The boundary and internal integers determine, respectively, the 120 yods lining the sides of the seven enfolded polygons and the 144 yods that are inside them. The integers at the two other corners of the array add up to 8, which is the number of corners of the *ten*-sided decagon outside the root edge. The number 10 arithmetically determines various parameters of the inner Tree of Life, as well as the number 66 because it is the *tenth* triangular number after 1. If we now consider two such triangular arrays sharing one apex, the number sum of the 131 integers is 524, which is the yod population of the inner form of the Tree of Life. This pattern of integers reproduces the yod population of the (7+7) enfolded Type A polygons. *It is an arithmetic representation of the inner Tree of Life*. The number 131 is the number of yods that line the sides of the tetractyses in a 26-sided Type A polygon. Students of Kabbalistic gematria will recognise 26 as the number value of Yahweh, the Godname of Chokmah in the Tree of Life, and the number 65 as the number value of Adonai, the Godname of Malkuth. This is the Divine Name that Jews pronounce as a replacement of Yahweh, which they are forbidden to pronounce.

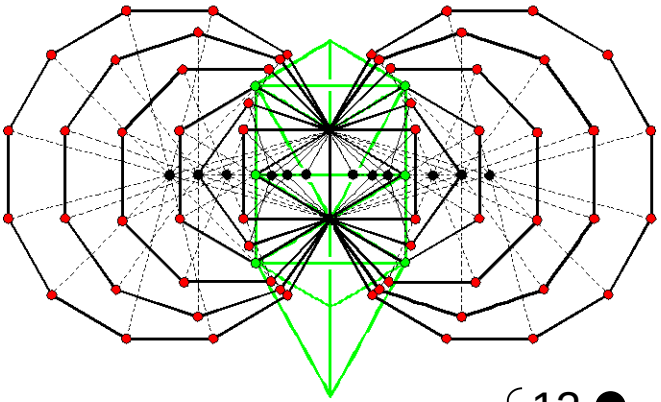


The 72 yods surrounding the centre of the Type A dodecagon correspond to the 72 corners of the 94 sectors of the (7+7) enfolded polygons outside their root edge that are intrinsic to the inner Tree of Life because they do not coincide with corners of triangles in its outer form. The 12 corners and 60 hexagonal yods in the Type A dodecagon correspond to the 12 centres and 60 corners that make up these 72 intrinsic corners. The (84+84=168) polygons enfolded in 12 Trees of Life have (12×72=864) intrinsic corners that comprise (12×12=144) intrinsic centres and (12×60=720) polygonal corners. Their counterpart in the 864 ft vertical line is its division by the horizontal line into a section of 144 ft and a section of 720 ft.



Type A dodecagon

72 { 12 ● 60 ●



6 shared corners ●

72 { 12 ● 60 ●

●/● = corner of sector of polygon outside a root edge that is unshared with the outer Tree of Life.

● = corner of sector of polygon outside a root edge that is shared with the outer Tree of Life.

Fig. 12

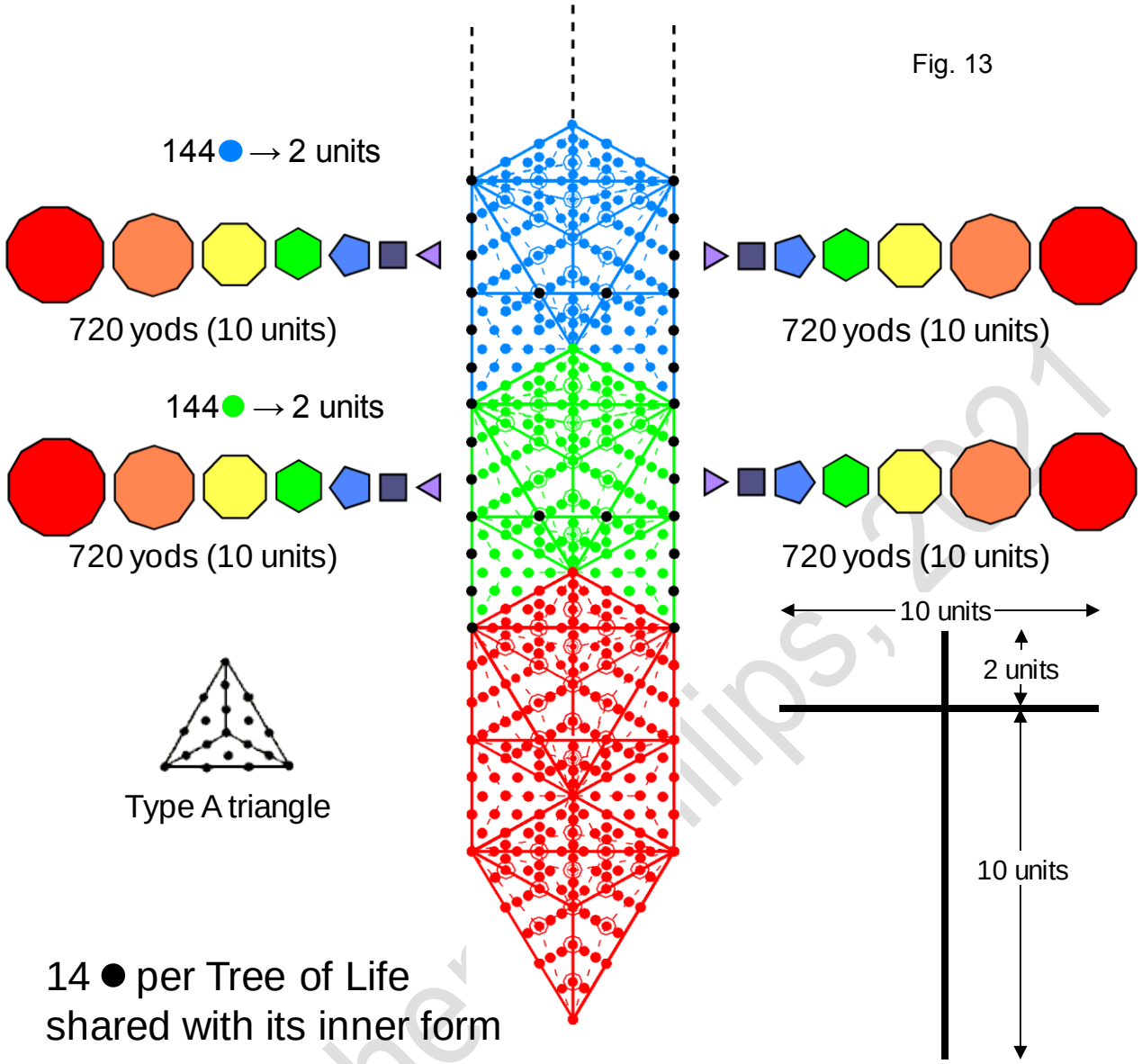
5. The dodecagonal & inner Tree of Life basis of the 144:720 division in Nolan's Cross

The (7+7) enfolded polygons of the inner Tree of Life have (47+47=94) sectors with 80 corners. The centre of each hexagon and their top and bottom corners coincide with corners of triangles that belong to the outer Tree of Life, being the locations of Chokmah, Chesed & Netzach on the Pillar of Mercy and Binah, Geburah & Hod on the Pillar of Judgement. The centre of each triangle coincides with a hexagonal yod on the Path connecting Chesed and Geburah. The number of corners of the 14n polygons enfolded in n overlapping Trees of Life ≡ N(n) = 78n +2, where "2" denotes the topmost corners of the two hexagons belonging to the inner form of the nth Tree of Life; these coincide with the lowest corners of the two hexagons enfolded in the (n+1)th Tree of Life. The number of corners that are shared with the n Trees ≡ N'(n) = 6n + 2. The number of corners that are intrinsic to the inner form of n Trees = N(n) − N'(n) = 72n. With every successive Tree, 72 *new* corners appear in its inner form. An n-gon whose sectors are 2nd-order tetractyses has 72n yods surrounding its centre, each sector adding 72 yods. There are 6n yods surrounding the centre of an n-gon when it is Type A with 1st-order tetractyses as its sectors. The number of Sephirothic emanations in n Trees of Life is 6n + 4, so that every successive Tree has six emanations. They are analogous to the six yods added by successive sectors of the n-gon. An n-gon with 1st-order tetractyses as its sectors is analogous to the outer form of n overlapping Trees; an n-gon whose sectors are 2nd-order tetractyses is analogous to that part of the inner form of n Trees whose corners are intrinsic to it. Just as a Type A dodecagon represents the outer form of 12 Trees because its 72 yods correspond to the 72 emanations in every Trees, so a dodecagon with 2nd-order tetractyses as its sectors represents their inner form because its 864 yods correspond to the (12×72=864) intrinsic corners present in 12 Trees.

Of the 72 yods per 2nd-order tetractys sector of an n-gon, 12 yods line its sides, leaving 60 internal yods. A dodecagon has 864 yods that comprise (12×12=144) boundary yods and (12×60=720) internal yods. Compare this with the vertical line of Nolan's Cross. It is 864 ft long and extends 144 ft beyond the arms of the cross, which are 720 ft from its base. What is the counterpart of the 60:12 division in the 72 intrinsic corners of the 94 sectors of the (7+7) enfolded polygons? Of the seven centres of each set of polygons, the centre of the hexagon coincides with either Chesed or Geburah (see Fig. 12). Twelve of the 14 centres are not corners of triangles that belong to the outer Tree of Life. There are (72−12=60) intrinsic corners that are not centres. The (12×14=168) polygons enfolded in 12 Trees of Life have (12×72=864) intrinsic corners, of which (12×12=144) are centres of polygons that are surrounded by (12×60=720) other intrinsic corners. This 144:720 distinction compares with the horizontal line dividing the vertical line into sections of 144 ft and 720 ft. We see that both 12 Trees of Life and the dodecagon — its polygonal representation — possess the *same* 144:720 division as the vertical line.

The horizontal line of length 720 ft corresponds to 10 Trees of Life with (10×720=720) intrinsic corners of its (70+70) polygons outside their root edges. 360 such corners belong to the 70 polygons enfolded on one side of the 10 Trees and 360 intrinsic corners belong to their counterparts on the other side. The counterpart of this in Nolan's Cross is the division of the horizontal line into two equal lengths of 360 ft. The cross is a representation of the skeletal geometry of the inner form of 22 Trees of Life. As we shall discover later, it also represents a *single* Tree of Life and its inner form. Three overlapping Trees of Life have 22 Sephirothic emanations. It is legitimate to represent each emanation by a complete Tree of Life. If we represent the three large-scale dimensions of space by three such Trees, it becomes clear why 22 Trees of Life are involved in this skeletal representation of Nolan's Cross.

Fig. 13



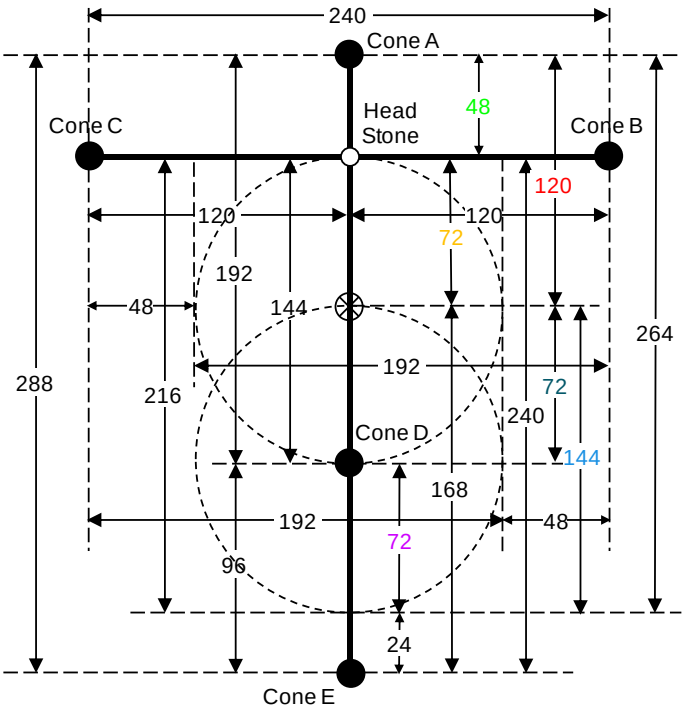
The n-tree has (12n+7) triangles with (6n+5) corners and (16n+9) sides. Inside a Type A triangle are 10 yods. Two hexagonal yods line each side. Number of yods in the n-tree ≡ N(n) = 6n + 5 + 2(16n+9) + 10(12n+7) = 158n + 93. The inner form of each Tree of Life comprises (7+7) enfolded regular polygons. The plane containing them is that generated by the Pillars of Mercy and Judgement. The two hexagonal yods on the Path connecting Chesed and Geburah coincide with the centres of the two equilateral triangles belonging to the (7+7) polygons of the inner Tree of Life. The seven yods on each side pillar coincide with yods on the vertical line joining the top and bottom corners of the hexagons. The number of yods in the n-tree that are shared with its 14n polygons making up its inner form = 14n + 2, where "2" denotes the top corners of the two hexagons belonging to the inner form of the nth Tree of Life. The number of yods in the n-tree that are unshared with its inner form ≡ Ñ(n) = 158n + 93 – (14n+2) = 144n + 91. The number of such intrinsic yods in successive Trees of Life = Ñ(n+1) – Ñ(n) = 144. The horizontal line of the Nolan's Cross of length 720ft (10 units) corresponds to the 720 yods in one set of seven Type B polygons; the vertical section up to the horizontal line is of length 720 ft. It corresponds to the 720 yods in the other set of Type B polygons. The section above the horizontal line of length 144ft corresponds to the 144 yods in successive Trees that are intrinsic to each Tree.

6. Outer & inner Tree of Life basis of the 144:720:720 division in Nolan's Cross

Suppose that we consider the n-tree (the lowest n of any set of N overlapping Trees (n<N) and transform all its triangles into Type A triangles. The number of yods in the n-tree is N(n) = 158n + 93 (for proof, see Fig. 13). Each outer Tree has an inner form consisting of (7+7) enfolded regular polygons that lie in the plane defined by the parallel straight lines of the Pillar of Mercy and the Pillar of Judgement. When they, too, are regarded as Type A polygons, some of their yods are also yods of the Type A triangles in the Trees of Life. As these Pillars are the vertical axes of the hexagons belonging to successive sets of polygons, all the yods lying on them are shared between the outer and inner Trees of Life. The centres of the two triangles belong to the inner Tree coincide with the hexagonal yods on the Chesed-Geburah Path. Seven yods line each side Pillar of each Tree. However, the top yod, which coincides with either Chokmah or Binah, is not only the top of the hexagon associated with an outer Tree but is also the bottom of the hexagon associated with the next higher Tree. Therefore, (6+1=7) yods per Tree are shared between its outer and inner forms. The number of yods shared in the n-tree = 7n + 1 + 7n +1 = 14n + 2, where "2" denotes the topmost corners of the two hexagons associated with the nth Tree. They are coloured black in Fig. 13. The number of yods in the n-tree that are intrinsic to it in the sense that they are unshared with the inner forms of each constituent Tree ≡ N′(n) = N(n) – (14n+2) = 144n + 91. Hence, the number of intrinsic yods in successive Trees = N′(n+1) − N′(n)= 144. They are shown in Fig. 13 as the 144 green yods in the second Tree above the lowest Tree with red yods and as the 144 blue yods in the third Tree above the second Tree. When the unit of length for Nolan's Cross is chosen as 72 ft, these 144 intrinsic yods signify two units of length, a yod symbolising the length of one foot. There are 720 yods surrounding the centres of the seven Type A polygons making up each half of the inner Tree of Life. They define two lengths of 10 units. Associated with each Tree are its 72 intrinsic yods and the two sets of 720 yods that surround the centres of the 14 separate polygons making up its inner form. Each successive Tree contains in the yod populations of its outer and inner forms the numerical counterpart of the 144:720:720 pattern of Nolan's Cross, each yod denoting the standard unit length of one foot.

Nolan's Cross

Fig. 14



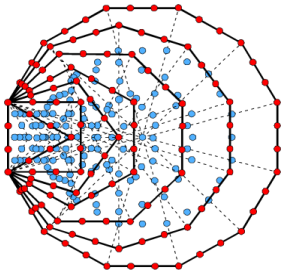
1 unit = 1 yard

$288 = 1^1 + 2^2 + 3^3 + 4^4 = 17^2 - 1$
$= 3 + 5 + 7 + \ldots + 33.$
$72 = \frac{1}{4}(1^1 + 2^2 + 3^3 + 4^4).$

$120 = 4\times30 = 2^2(1^2 + 2^2 + 3^2 + 4^2)$
$= 2^2 + 4^2 + 6^2 + 8^2$
$= 11^2 - 1 = 3 + 5 + 7 + \ldots + 21.$
$288 - 120 = 168 = 23 + 25 + 27 + \ldots + 33.$

Total length of two lines = 288 + 240
$= 528 = 33\times16$
$= 1 + 2 + 3 + 4 + \ldots + 32$
$= 23^2 - 1 = 3 + 5 + 7 + \ldots + 45.$
$528 - 288 = 240 = (35+37) + 39 + \ldots + 45$
$= 72 + 168,$
where $168 = 39 + 41 + 43 + 45$
$= (39+45) + (41+43) = 84 + 84.$

$264 = 120 + 144 = (48+72) + (72+72).$



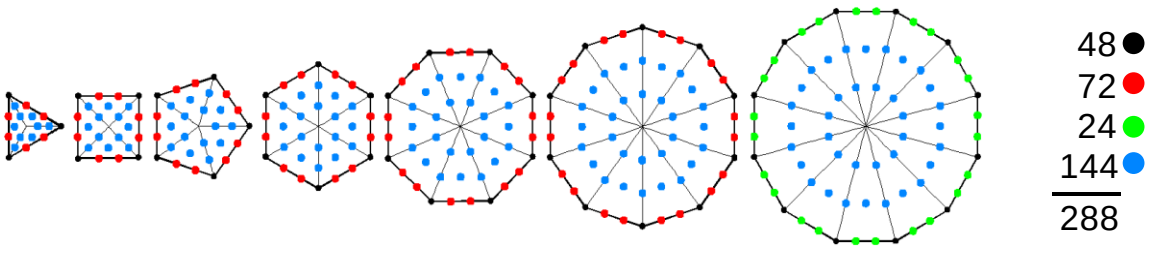
The 7 enfolded Type A polygons have 264 yods

	Triangle	Square	Pentagon	Hexagon	Octagon	Decagon	Dodecagon
Number of boundary yods	9	8	11	14	20	26	32
Number of internal yods	10	13	16	13	25	30	37

120 ● boundary yods (48 in the triangle, square, pentagon & octagon, 72 in the hexagon, decagon & dodecagon).
144 ● internal yods (72 in the triangle, octagon & dodecagon, 72 in the square, pentagon, hexagon & decagon).

Length of vertical line = 288
= 48 + 144 + 72 + 24 = 144 + 144',
where 144' = 48 + 72 + 24.
48 → 48 corners of 7 separate Type A polygons.
72 → 72 hexagonal yods on sides of 1st 6 polygons.
24 → 24 hexagonal yods on sides of dodecagon.
144 → 144 yods inside 7 separate Type A polygons.

The length (288 yards) of the vertical line in Nolan's Cross corresponds to the 288 yods surrounding the centres of the 7 Type A polygons in the inner Tree of Life.



48 ●
72 ●
24 ●
144 ●
288

7. Arithmetic properties of cone-cone distances

Taking the units of distance as one yard, the lengths of the vertical and horizontal lines forming Nolan's Cross are, respectively 288 and 240. The former is the sum of the integers 1, 2, 3 & 4 symbolised by the four rows of dots in the Pythagorean tetractys, raised to the same powers:

$$288 = 1^1 + 2^2 + 3^3 + 4^4.$$

It is also the sum of the 16 odd integers after 1:

$$17^2 - 1 = 288 = 3 + 5 + 7 + \ldots + 33.$$

The number 240 is the sum of the first 15 even integers:

$$240 = 2 + 4 + 6 + \ldots + 30.$$

The total length of the two lines is 528, which is the sum of the first 22 integers after 1:

$$528 = 23^2 - 1 = 3 + 5 + 7 + \ldots + 45.$$

Therefore, the number 240 is the sum of the six odd integers after 33:

$$240 = 35 + 37 + 39 + 41 + 43 + 45.$$

The lengths of the two lines are determined arithmetically by the 16:6 division of the 22 odd integers making up the number 528. The sum of the first 6 odd integers after 1 is 48, which is the length of the section of vertical line above the horizontal line:

$$7^2 - 1 = 48 = 3 + 5 + 7 + 9 + 11 + 13.$$

The length 240 of the vertical line below the horizontal line is the sum of the next 10 odd integers:

$$240 = 15 + 17 + 19 + \ldots + 33.$$

This divides into 72 and 168 as the sums of, respectively, the first four of these integers:

$$72 = 15 + 17 + 19 + 21,$$

and the last six odd integers:

$$168 = 23 + 25 + 27 + 29 + 31 + 33.$$

Notice that the second expression for the number 240 has this property as well:

$$240 = (35+37) + (39+41+43+45) = 72 + 168,$$

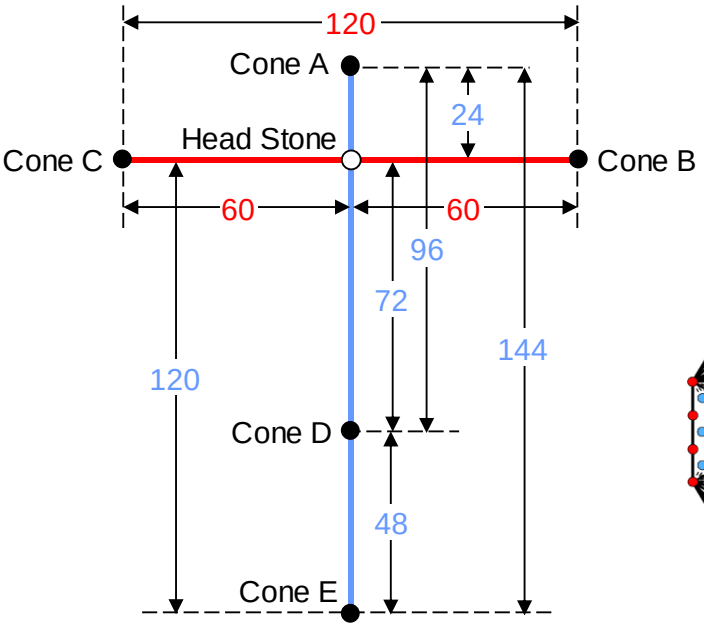
where 168 = (39+45) + (41+43) = 84 + 84. Fig. 14 discusses the deep significance of these divisions.

Fig. 3 illustrates these and other numbers in terms of various sections created by two similar circles of radius 72 that lie on the vertical axis and overlap centre-to-circumference to form a Vesica Piscis of height 72 and width $72\sqrt{3}$. This creates three section of length 72, the first two being the distance of Cone D below the horizontal line, and leaves a section of length 24, which starts 264 units below Cone A. Therefore:

$$264 = 48 + 72 + 72 + 72.$$

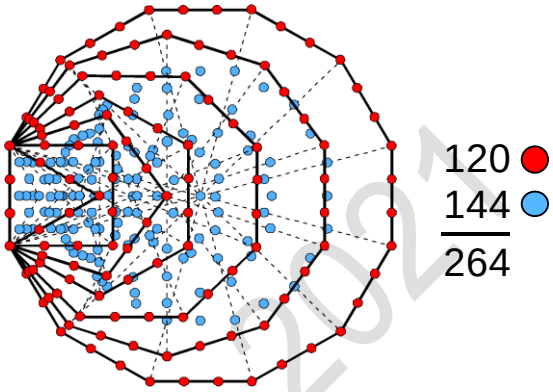
The number of yods in the seven enfolded Type A polygons in each half of the inner Tree of Life is 264. They consist of 120 yods (coloured red) lining the sides of the polygons and 144 internal yods (coloured blue). The former comprises 48 yods in the triangle, square, pentagon & octagon and 72 yods in the hexagon, decagon & dodecagon. The latter consists of 72 yods inside the triangle, octagon & dodecagon and 72 yods inside the square, pentagon, hexagon & decagon. Hence, 264 = 120 + 144 = 48 + 72 + 72 + 72, reproducing the length of the vertical line above the horizontal line and the three radii of length 72. We find that this topmost section corresponds to the 48 yods on sides of the triangle, square, pentagon & octagon, leaving (3×72=216) yods, where $216 = 3^3 + 4^3 + 5^3 = 6^3$.

The 288 yods that surround the centres of the seven separate Type A polygons denote the 288 units of length (yard) of the vertical line in Nolan's Cross. They are made up of their 48 corners (black yods), 96 hexagonal yods lining sides (72 red yods in the first six polygons and 24 green yods in the dodecagon) and 144 blue yods inside the seven polygons (72 in the triangle, square, pentagon & dodecagon, 72 in the hexagon, octagon & decagon). Compare this 48:72:72:72:24 pattern with the 48 units of length of the vertical section above the arms of the cross, the three sections of length 72 that are vertical radii of the two circles and the remaining length of 24 units. The length of 96 units between Cones D and E corresponds to the 96 hexagonal yods on the sides of the seven polygons. The length of 144 units between Cone D and the arms corresponds to the 144 yods that are inside the polygons.



Nolan's Cross

1 unit = 1 fathom (6 ft)



Inner Tree of Life

	Triangle	Square	Pentagon	Hexagon	Octagon	Decagon	Dodecagon	Total
Number of boundary yods	9	8	11	14	20	26	32	120
Number of internal yods	10	13	16	13	25	30	37	144
Total number of yods	19	21	27	27	45	56	69	264

120 ● boundary yods (60 in triangle, square, pentagon & dodecagon, 60 in hexagon, octagon & decagon);
144 ● internal yods (48 in triangle, square & octagon, 96 in pentagon, hexagon, decagon & dodecagon).

Length of vertical (blue) and horizontal (red) lines = 264 fathoms.

$$264 = (60+72) + (24+60+48) = 132 + 132.$$

Number of yods outside root edge in triangle, square, pentagon & dodecagon = 132 = number of yods in hexagon, octagon & decagon.

The horizontal and vertical distances of, respectively, 120 fathoms and 144 fathoms correspond to the 120 boundary yods and the 144 internal yods in the 7 enfolded Type A polygons of the inner Tree of Life.

Fig. 15

8. 120:144 divisions in Nolan's Cross and the inner Tree of Life

We pointed out earlier that the units of distance of either six feet or 72 ft are consistent with regarding sections of the Nolan's cross as representing the yod population of polygons present in the inner Tree of Life. The width of the cross is 720 ft, or 120 fathoms, whilst its vertical length is 864 ft, or 144 fathoms, the total length being 264 fathoms. Compare this with the 264 yods that make up the seven enfolded polygons of the inner Tree of Life (Fig. 15). 120 red yods line their boundaries, inside which are 144 blue yods. Each yod can symbolise one fathom as a unit of length. Moreover, the triangle, square, pentagon & dodecagon have 60 boundary yods, as do the hexagon, octagon & decagon. The boundary yods divide exactly into two sets of 60 yods that correspond, when yods symbolise the unit of the fathom, to the 60 fathoms width of each arm of the cross. Of the 144 yods inside the seven polygons, 48 belong to the triangle, square & octagon, whilst 96 belong to the pentagon, hexagon, decagon & dodecagon. The former corresponds to the distance of 48 fathoms between Cone D and Cone E; the latter corresponds to the 96 fathoms between Cone A and Cone D. Using the fathom as a unit of distance reveals clearly that the cross expresses the populations of boundary yods and internal yods of the inner Tree of Life, thereby confirming its status as sacred geometry.

When the fathom is the unit of distance, the vertical length of 144 fathoms and the horizontal length of 120 fathoms becomes readily understood. We saw in Fig. 8 that the 22 Paths of the outer Tree of Life consist of the 10 Paths which, as straight lines, make up its trunk and the 12 Paths which compose its branches. The sum of the distances between Cone A and Cone E and between Cone B and Cone C = 1584 ft = 264 fathoms, where 264 = 22×12 = (10+12)×12 = 120 + 144. The horizontal length represents the trunk and the vertical length represents the branches. The division 120:144 division in the 264 yods of the inner Tree means the same. The boundary of the seven enfolded polygons defines its shape and form, just as a tree trunk provides foundation for the life of the tree. Therefore, in terms of the analogy with its outer form, the boundary is the "trunk" and the polygons inside it and their yods constitute the branches and leaves. Nolan's Cross is not, as some people have believed, part of the geometry of the outer Tree of Life. Instead, the cross expresses its properties spatially in numbers. These properties have nothing to do with the relative proportions of the straight lines making up the outer Tree. These numbers are sacred numbers because they are parameters of *all* holistic systems designed according to the universal blueprint that is found in the sacred geometries of various world religions (see author's website).

The distance between Cone B and the Head Stone is 60 fathoms; the latter is 72 fathoms from Cone D. The sum of these distances is 132 fathoms, which is also the length of the remainder of the cross. This exact halving of the total length of 264 fathoms created by the Head Stone and the five Cones has its counterpart in the inner Tree of Life. Outside the root edge of the triangle, square, pentagon & dodecagon are 132 yods (see table in Fig. 15). Including the root edge, this is the number of yods in the hexagon, octagon & decagon. As 132 = 4×33 = 4(1! + 2! + 3! + 4!), we see how the integers 1, 2, 3 & 4 symbolised by the four rows of the tetractys express half the complete length of the cross.

The Decad (10), which is symbolised by the 10 points of the Pythagorean tetractys, determines the structural parameters 120 and 144 because 120 is the sum of the first 10 odd integers after 1:

$$120 = 11^2 - 1 = 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21,$$

whilst $144 = 12^2$, where 12 is the number of corners of the dodecagon, the *tenth* regular polygon. It is also the number of yods surrounding the centres of the two Type A dodecagons, which are the last of the seven polygons present in each half of the inner Tree of Life: 12×6 + 12×6 = 12×12 = 144. Because a fathom is six feet and there are six yods per sector of a polygon constructed from tetractyses, this nautical unit of depth becomes a natural unit of length to express distances in the features of Nolan's Cross because it enables line segments n fathoms long to be regarded as representing a tetractys-constructed polygon with n corners, each of its 6n yods symbolising the length of one foot and each sector with six yods representing one fathom.

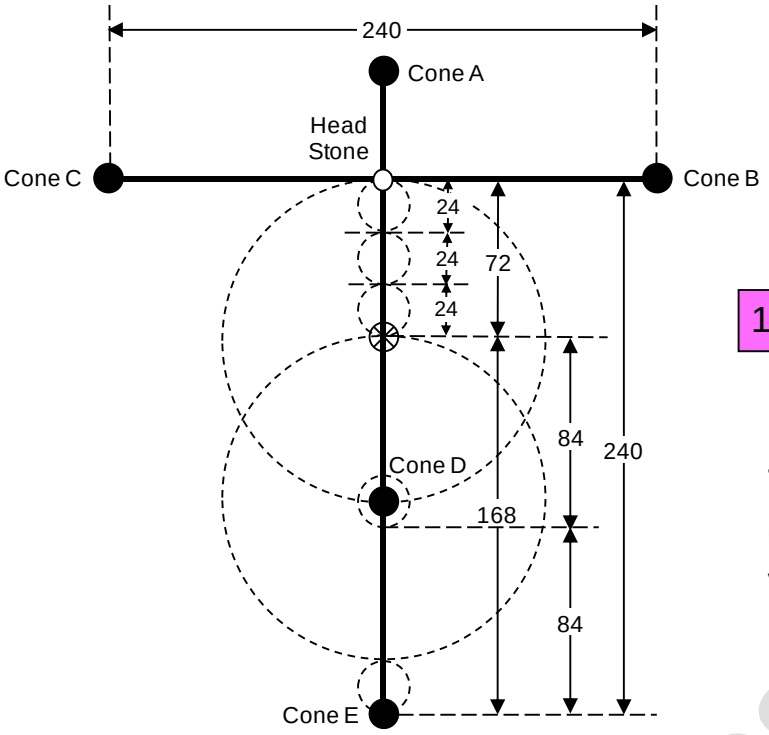


Fig. 16

1 unit = 1 yard

The 72:168 division in the vertical line of Nolan's Cross

The 240 non-zero roots of the superstring gauge symmetry group E_8

The roots of the E_8 Lie algebra are described in terms of eight orthonormal unit vectors $\{u_i\}$

Eight zero roots correspond to points at the centre of the root diagram and 240 non-zero roots all have length $\sqrt{2}$. They are given by

$$\pm u_i \pm u_j \qquad (i, j = 1, 2, \ldots 8)$$

and

$$\tfrac{1}{2}(\pm u_1, \pm u_2, \ldots \pm u_8) \qquad \text{(even number of +'s)}$$

Their explicit forms as 8-tuples and their numbers are listed below:

(1, 1, 0, 0, 0, 0, 0, 0) and all permutations. Number = $\binom{8}{2}$ = 28;

(-1,-1, 0, 0, 0, 0, 0, 0) and all permutations. Number = $\binom{8}{2}$ = 28;

(1,-1, 0, 0, 0, 0, 0, 0) and all permutations. Number = $2\times\binom{8}{2}$ = 56;

(-½,-½,½,½,½,½,½,½) and all permutations. Number = $\binom{8}{2}$ = 28;

(-½,-½,-½,-½,-½,-½,½,½) and all permutations. Number = $\binom{8}{2}$ = 28;

168

(-½,-½,-½,-½,½,½,½,½) and all permutations. Number = $\binom{8}{4}$ = 70;

(½, ½, ½, ½, ½, ½, ½, ½). Number = 1;

(-½,-½,-½,-½,-½,-½,-½,-½). Number = 1.

72

240

The 240 roots of E_8 forms sets of 72 and 168, the latter comprising two subsets of 84 roots (3×28 & (56+28)). The midway point ⊗ on the vertical line between the arms of the cross and Cone D divides it into sections of 72 and 168, the latter being divided into two halves of length 84 yards. It demarcates the 72 roots of E_6, one of the four exceptional subgroups of E_8.

9. Analogy between the 240 roots of E_8 and the 240 yards between the Head Stone & Cone E

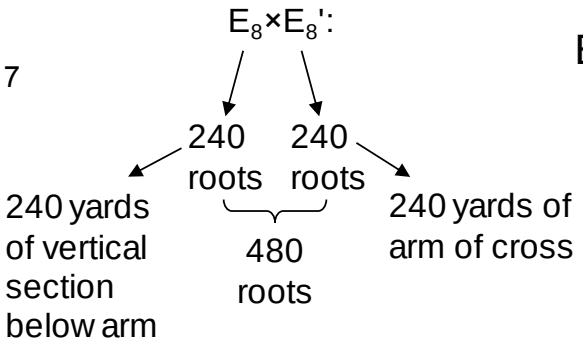
The rank-8 exceptional Lie group E_8 is of dimension 248. It has 248 roots, of which eight are so-called "zero roots," or "simple roots," and 240 are so-called "non-zero roots." The latter can be represented by vectors, all of length $\sqrt{2}$, in 8-dimensional space. In other words, they are denoted by 240 points on the surface of a 7-dimensional hypersphere of radius $\sqrt{2}$. A point on the hypersphere denoting a root vector has eight coordinates; they are either all integers or all half-integers. The 8-tuples of coordinates that represent the root vectors can be divided into various types, according to the values and signs of these coordinates (Fig. 16). The set of 240 roots comprises a subset of 72 roots and a subset of 168 roots, the latter dividing into two subsets of 84 roots.

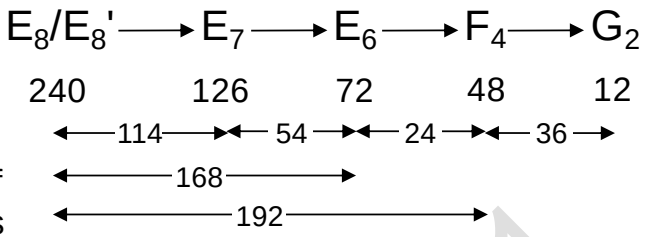
In Fig. 16, $\otimes$ marks midway between Cone D and the Head Stone, the point of intersection of the vertical and horizontal lines of Nolan's Cross. It is the centre of the upper circle of radius 72 yards and the same distance from Cone A (120 yards) as Cones B and C are from the middle of the horizontal line. Cone E at the foot of the cross is 168 yards from $\otimes$, so the latter marks the division 72:168 division of the vertical section of length 240 yards that is below the line connecting Cones B and C. The three vertical radii of the two intersecting circles can each be divided into three sections of length 24 yards (the diameters of three contiguous circles. If a similar circle is drawn with Cone D as centre, the lowest point on its circumference is 12 yards from Cone D, which is 96 yards from Cone E, so that this point is (96−12=84) yards from Cone E and 84 yards from $\otimes$.

The vertical section below the arms of the cross is 240 yards long. Each yard corresponds to one of the 240 roots of E_8. The 72:168 division of this section marked by the point $\otimes$ corresponds to the subsets of 72 and 168 roots. The latter further divides into two subsets of 84 roots. The group-theoretical details of this split need not digress us. The vital point is that, dividing the lines into segments of 24 yards (the unit of distance that reduces all section lengths to integers) so that the vertical line has 12 segments and the horizontal has 10 segments, produces a natural 72:168 division marked by the point $\otimes$, just as the 240 roots of E_8 do through its subgroup E_6.

Nolan's Cross maps the root composition of the $E_8 \times E_8$ symmetry group of heterotic superstrings and the 4 exceptional subgroups of E_8

Fig. 17

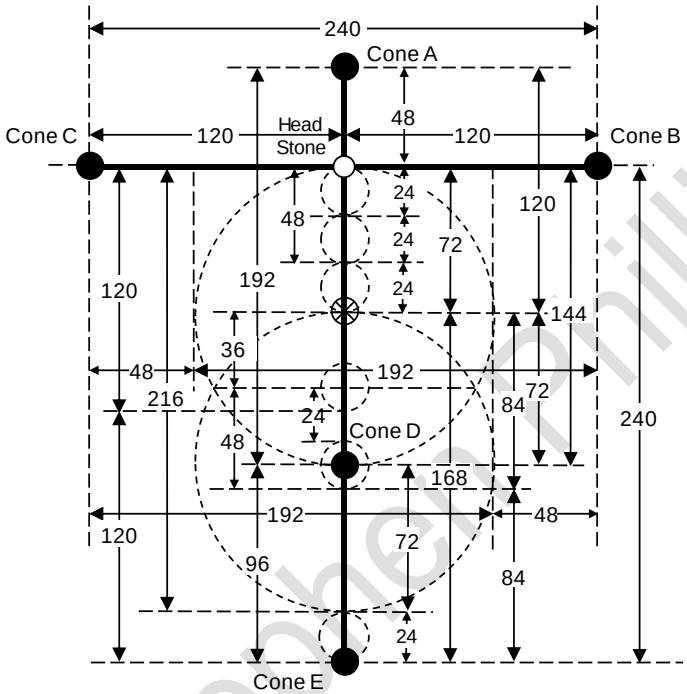




1 yard corresponds to a root of E_8 or E_8'

1 unit = a yard

Nolan's Cross

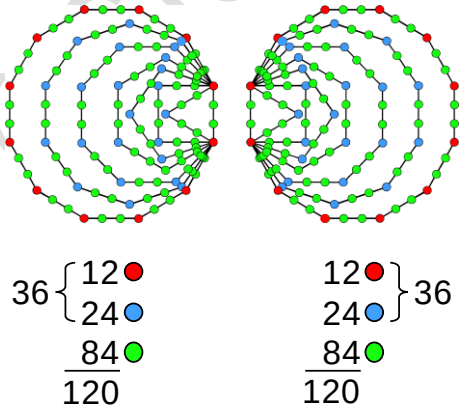


Various patterns of roots in E_8 and its exceptional subgroups that appear in Nolan's Cross and the two halves of the inner Tree of Life.

$240 = 168 + 72$
$= 216 + 24$
$= 192 + 48.$
$192 = 168 + 24.$
$120 = 48 + 72$
$= 36 + 84.$
$168 = 84 + 84$
$= 72 + 96.$
$84 = 36 + 48.$

Fig. 18

Fig. 19



Each set of 7 enfolded polygons making up one half of the inner Tree of Life is lined by 120 yods (36 red or blue corners & 84 green hexagonal yods). This 72:168 division of the 240 boundary yods, where 72 = (24+24+24) and 168 = 84 + 84, appears in Nolan's Cross and is marked by the centre ⊗ of the upper circle of radius 72 yards. The 240 roots of E_8 consist of the 72 roots of its exceptional subgroup E_6 and 168 other roots. They correspond to the length of vertical line 72 yards long midway to cone D and the remaining length 168 yards to cone E.

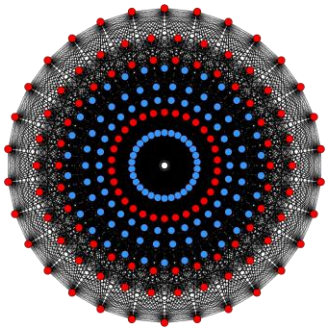
10. Nolan's Cross as a spatial representation of $E_8 \times E_8'$

It is not a coincidence that the lengths of the horizontal line and the vertical section below it have the same length of 240 yards. It had to be so because each represents a half of the inner Tree of Life, every yard corresponding to one of the 240 hexagonal yods in the seven Type A polygons that make up that half. The meaning of these hexagonal yods is that they denote the 240 roots of E_8, the two similar sets of polygons generating the direct product $E_8 \times E_8'$, where E_8' is the same group as E_8 but distinguished from it by the prime sign in order to indicate that it is a copy. This is one of the two symmetry groups that were discovered in 1984 to lead to superstring interactions that are free of quantum anomalies. It indicates that heterotic $E_8 \times E_8'$ superstring theory is encoded in the Tree of Life (the fact that the gematria number value of Malkuth, signifying the physical universe, is 496 — the dimension of a symmetry group that is free of quantum anomalies — was an early clue to this amazing conclusion). The length of the cross apart from the vertical section above its arms is (240+240=480) yards. This corresponds to the 480 roots of $E_8 \times E_8'$ (Fig. 17). It is improbable that this similarity could be coincidental. The designers of Nolan's Cross could have placed Cone E at some other spot so that the lower vertical section was not the same length as that of the arms of the cross. Even if it were essential for Kabbalistic reasons that the overall length of the two lines should be 22 units, this could have been achieved by choosing different lengths for these sections. The fact that they are equal in length is non-trivial and requires explanation. The reason for this feature is, of course, *not* that that they had knowledge of group theory centuries before anyone else and realised the significance of $E_8 \times E_8'$ for the natural world! Rather, they understood Kabbalah deeply enough for parameters of the Tree of Life like 240 and 480 to appear *naturally* in their design of Nolan's Cross, which was never intended to be part of the Tree of Life because its measurements were chosen to express its hidden properties, not its outward appearance. The makers of the cross did not need to be familiar with the mathematical details of what today's superstring theorists know about these numbers. If a universal blueprint for the universe really *does* exist (and the author's research has uncovered evidence for it in his website and latest book by proving isomorphism between the sacred geometries of some ancient religions), these people could have chosen measurements for the cross in order for it to embody some of the things that they understood about the cosmic blueprint. If $E_8 \times E_8'$ heterotic superstring theory is an integral part of it, the presence in the cross of various mathematical parameters of this theory is not even surprising, let alone problematic.

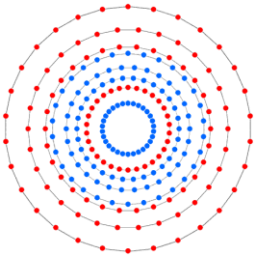
As the largest of the five exceptional groups E_8 has four exceptional subgroups. In decreasing numbers of roots, they are: E_7 (126 roots), E_6 (72 roots), F_4 (48 roots) & G_2 (12 roots). E_8 has 192 more roots than F_4 and 168 more roots than E_6. Fig. 18 indicates that the former is the distance between Cone A and Cone D, as well as the horizontal distance between the edge of the dashed-line circle and either Cone B or Cone C , whilst the latter between Cone E and the centre $\otimes$ of this circle. E_7, the largest exceptional subgroup of E_8 with 126 roots, is not present in the measurements, but this is not problematic because four of the five Cones are needed to define E_8 and E_8', and more markers would have been required to reveal the number 126. There was no reason to do this. E_8 has *many* subgroups, and it would be ridiculous to ask why they are not all explicitly marked out, as the designers, obviously, never had this on their minds! The essential point to be made here is that all the various divisions between roots of the exceptional groups and distances between points in the geometry underlying the cross have been identified by the author as being characteristic of the various sacred geometries that he previously studied. He has concluded from these correspondences that, insofar as these geometries encode information about the nature of reality — superphysical as well as physical — they confirm that $E_8 \times E_8'$ heterotic superstring theory is part of what they describe in analogous ways.

Fig. 19 illustrates this for the inner Tree of Life. Each set of seven enfolded polygons has 120 yods lining their sides, whether they are Type A, Type B, etc. Of these, 36 yods are corners (12 red corners of the dodecagon and 24 blue corners of the first six enfolded polygons), the remaining 84 green yods being hexagonal yods. The pair of *separate* sets of seven enfolded polygons have 240 boundary yods comprising 72 corners (24 red corners, (24+24=48) blue corners) and (84+84=168) hexagonal yods. Compare this 72:168 division of the class of 240 boundary yods with the 240 roots of E_8 being composed of the 72 roots of E_6 and 168 other roots. Compare it also with how, when a circle of radius three units (72 yards) is drawn so that it touches both the horizontal line and Cone D, its centre $\otimes$ divides the vertical section of length 10 units (240 yards) so that a section of length seven units (168 yards) is below it. Three contiguous circles of radius one unit (24 yards) can be drawn above this point. The length of the uppermost two circles is two units (2×24=48 yards). It corresponds to F_4, the rank-four, exceptional subgroup of E_6 with 48 roots and to the 2×24 blue corners. To complain that it is not marked by any cone is to miss the point; the natural unit of 24 yards that reveals a Kabbalistic influence because the total length of the cross is then 22 units allows in principle any construction *based upon this unit* to be imposed on the basic geometry, for the designers were *thinking* in terms of this unit even though they measured in terms of feet, as was their every-day practice. Nolan's Cross can be thought of as the plans of a minimalist architect. It contains far more information than what the eye sees.

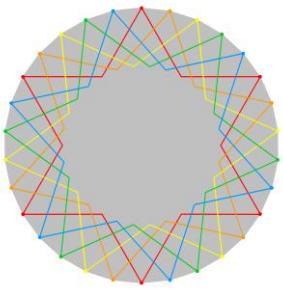
Fig. 20



The 240 vertices of the 8-d 4_{21} polytope represent the 240 roots of E_8



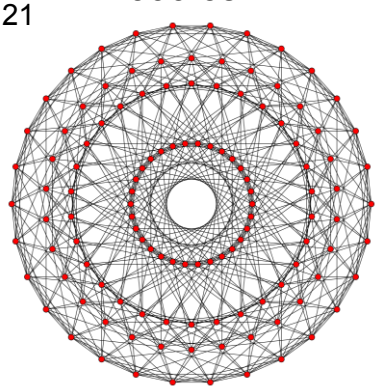
Eight concentric triacontagons are formed by the E_8 Coxeter plane projection of the (120+120=240) vertices of the 4_{21} polytope



The 30 corners of a triacontagon form 5 hexagrams

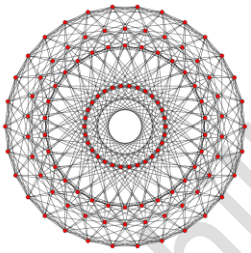
Fig. 21

600-cell



120 vertices

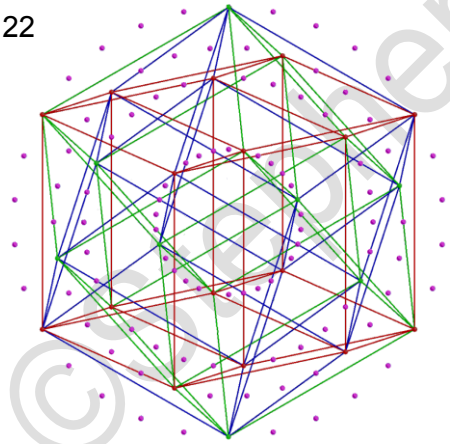
600-cell



120 vertices

The (120+120) corners of the two sets of 4 triacontagons are the H_4 Coxeter plane projection of two 600-cells, each with 120 vertices, one inside the other. A 600-cell is the compound of 5 disjoint 24-cells, each with 24 unshared vertices represented by the 6 corners of a hexagram in each of the 4 triacontagons. There are 10 ways to partition the 120 vertices of the 600-cell into 5 such 24-cells.The ratio of the circumradius of the 600-cell to its edge is the Golden Ratio Φ.

Fig. 22



The 4 triacontagons formed by the Coxeter plane plane projection of the 600-cell

One of the five 24-cells in the 600-cell. Each has 24 vertices arranged as the corners of a hexagon/hexagram in each of the four triacontagons. The horizontal arm of Nolan's Cross is 240 yards long, as is the vertical section below it. Each may be thought of as divided into 10 sections of 24 yards, a section corresponding to a 24-cell, with each vertex being the counterpart of a single yard.

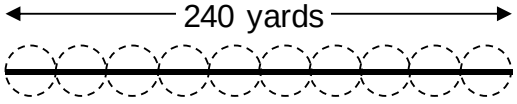


Fig. 23

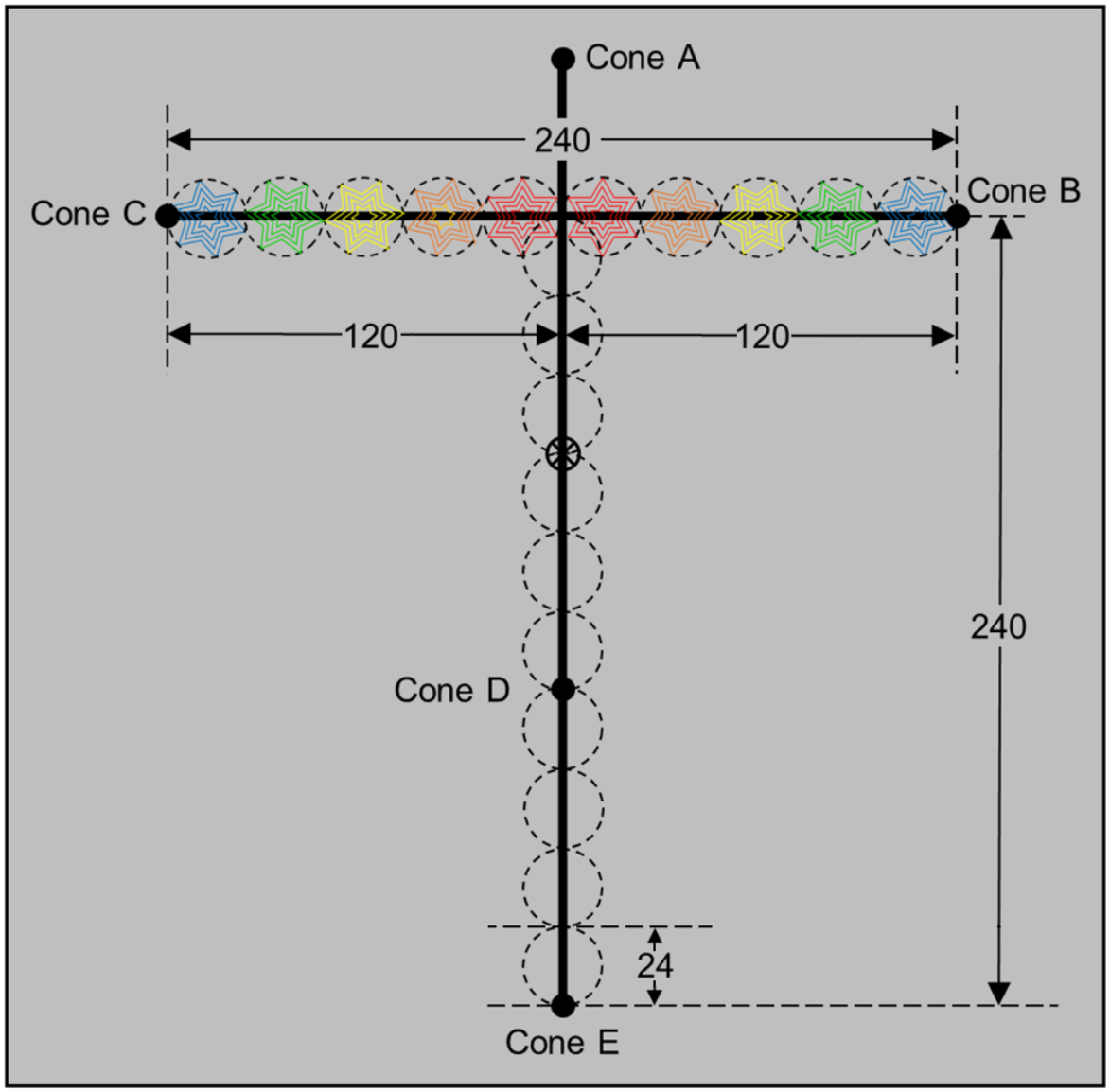
Four nested hexagrams with 24 corners can symbolise a 24-cell with 24 vertices (they do not have the same orientation in every one of the 4 triacontagons). It corresponds to a section of line 24 yards long. A corner symbolises the length of one yard.

11. Analogy between the (120+120) vertices of two 600-cells and the (120+120) yards in the arms.

In 1900, Thorold Gosset, an English lawyer and amateur mathematician, discovered and classified the semiregular polytopes during his spare time. He found that the 240 vertices of the 8-dimensional, so-called "4_{21} polytope" represented the 240 roots of E_8, the rank-8, exceptional Lie group. Their orthographic projection in the E_8 Coxeter plane (Fig. 20) generates the 240 corners of eight concentric triacontagons. These are two sets of four triacontagons (red & blue), each with 120 corners. Each set is the H_4 Coxeter plane projection of a 600-cell, one of the six polychorons (the regular polytopes) (Fig. 21). It is the 4-dimensional counterpart of the icosahedron, the fourth of the five regular polyhedra, well-known as the five "Platonic solids." Projected into 4-dimensional space, the 240 vertices of the 4_{21} polytope become the (120+120) vertices of a compound of two 600-cells, one smaller than the other and inside it. The 24-cell is a polychoron with 24 vertices. A 600-cell is the compound of five disjoint 24-cells, i.e., none of their vertices are shared (Fig. 22). There are 10 ways to partition the 120 vertices of a 600-cell into five such 24-cells. The two 600-cells consist of (5+5=10) 24-cells, i.e., 10 distinct sets of 24-cells.

The 30 corners of a triacontagon form five hexagrams/hexagons. The 24 vertices of the 24-cell are represented by the six corners of a hexagram/hexagon in each of the four triacontagons whose 120 corners represent the five sets of 24 vertices of the 24-cells. A 24-cell in one 600-cell is defined by four hexagrams/hexagons, one per triacontagon. A 24-cell in the smaller 600-cell is similarly defined for the four other triacontagons. There are five disjoint 24-cells in each 600-cell because each triacontagon is formed by five hexagrams/hexagons. If we represent a 24-cell symbolically as a straight line 24 units long, each vertex symbolised by a unit length, the (5+5=10) 24-cells that are the projection of the 240 vertices of the 4_{21} polytope are represented by a straight line divided into (5+5=10) segments, each 24 units long. A straight line of length (5×24=120) units represents each 600-cell. When the unit is a yard, it corresponds to the horizontal line in Nolan's Cross divided into two halves of length 120 yards. Similar considerations apply to the vertical section of length 120 yards below the arms of the cross, although Cone D divides it into sections of 144 yards and 96 yards, corresponding to, respectively, six 24-cells with 144 vertices and four 24-cells with 96 vertices. Every section of 24 yards can be regarded as corresponding to the 24 corners of four hexagrams/hexagons. They are shown in Fig. 23 symbolically as nested, although this is only for clarity. The four hexagrams (one from a triacontagon in each set of four triacontagons and all different in size), whose 24 corners denote the 24 vertices of a 24-cell, are not all aligned in the way shown there.

The analogy between the two sets of five 24-cells with (120+120) vertices and the two halves of the horizontal line, each of length 120 yards, gives additional justification for claiming that the natural unit of length in Nolan's cross is 24 yards. We have seen that modelling lengths in terms of the yod population of polygons constructed from 2nd-order tetractyses requires this, for, if a unit of length corresponds to a sector of a polygon whose yod population quantifies in that unit the length of some straight line, it must correspond to the 72 yods per sector. This makes it natural to let a yod symbolise a length of one foot, so that the unit of length is 72 feet, or 24 yards. Having measurements that can be expressed in either feet or yards permits two systems of numbers to coexist, each system parameterising the same object, whether it be Nolan's Cross or its Tree of Life counterpart.



Nolan's Cross is a representation of the (240+240) roots of $E_8 \times E_8'$.

Fig. 24

1 yard → corner of triacontagon

= 4 hexagrams (one from each of the 4 triacontagons in the Coxeter plane projection of the 600-cell). Their 24 corners denote the 24 vertices of a 24-cell. The 600-cell is a compound of 5 24-cells. Each half-arm of Nolan's Cross is 120 yards long. Each yard corresponds to a vertex of a 600-cell. Each of the 5 sections of length 24 yards symbolises a 24-cell. The two half-arms represent the vertices of a compound of two 600-cells, one smaller than the other and inside it. This is the Coxeter plane projection of the 240 vertices of the 4_{21} polytope. The horizontal line represents the 240 roots of E_8. Below it is a vertical line of length 240 yards that can be similarly divided into 10 sections of 24 yards. They correspond to the 10 24-cells making up two 600-cells, so that this vertical line represents the 240 roots of E_8'. Nolan's Cross expresses the 480 roots of $E_8 \times E_8'$, the symmetry group of $E_8 \times E_8'$ heterotic superstrings.

12. Nolan's Cross as a representation of the (240+240) roots of $E_8 \times E_8'$

The vertical section below the arms of Nolan's Cross can be divided into 10 segments, each 24 yards long. A segment is one unit long. The horizontal line can be similarly divided into 10 segments of the same length. The size of these units is not arbitrary, because it is determined by two constraints:

1. the total length of the two crossed lines had to be an integer multiple of 22 in order to create an analogy with the 22 straight lines (Paths) in the outer Tree of Life;
2. as polygons make up sacred geometry, using just straight lines to represent them by means of their lengths requires using a basic unit of length that corresponds to what is needed to express each triangular sector when it is regarded as a 1st-order tetractys with 10 yods, a 2nd-order tetractys with 85 yods, etc. In the first case, the unit is six feet (the mariner's fathom) because there are six yods per sector; each one symbolising the length of one foot; in the second case, it is 72 feet because there are 72 yods per sector.

With the foot as the standard unit of length, two new units of length are permitted when polygons are represented by lines— one of two yards (the fathom) and one of 24 yards. This makes it permissible to divide any length measured according to the former unit into two equal parts. If we do this, for example, to the horizontal arm in Nolan's Cross of length 240 yards, then it becomes 120 fathoms long, so that it can represent the 120 vertices of a single 600-cell, the vertical and horizontal lines representing *two* 600-cells with 240 vertices as the 4-dimensional projection in the H_4 Coxeter plane of the 240 vertices of the 4_{21} polytope. Each line now represents a *single* 600-cell, and the two lines of total length 240 fathoms correspond to the 240 roots of E_8 and to the seven polygons in *either* half of the inner Tree of Life. Each line of length 120 fathoms corresponds to a set of polygons with 24 corners and 120 hexagonal yods. Everything now represents E_8, not $E_8 \times E_8'$. The (120+120) fathoms have their counterparts in the 120 root vectors of E_8 and their 120 inverted counterparts, in which all the positive values of the coordinates of the former are changed to negative values and all negative coordinates are changed to positive ones. The change of unit: yard→fathom halves all numbers in Nolan's Cross that measure distances in yards, and this allows its measurements to apply simultaneously to the root compositions of $E_8 \times E_8'$ and E_8 (or E_8').

The vertical and horizontal segments of length 240 yards can each be regarded as a linear representation of 10 24-cells with 240 vertices. Fig. 24 depicts a 24-cell as a circle with four nested hexagrams, in reference to their representation by six corners in each of four triacontagons. The unit of length of 24 yards represents the 24 vertices of a 24-cell, each yard denoting a vertex. The author uncovered evidence of the holistic nature of this polychoron in his Article 66 available at his website. The same 120:120 pattern expressed by the Head Stone dividing the horizontal line into two halves of 120 yards appears in the 24-cell. It has 24 vertices and 96 edges (120 0- & 1-polytopes) and 96 triangular faces and 24 octahedral cells (120 2- & 3-polytopes). This re-appearance of a holistic pattern in a component of a holistic system that globally exhibits this pattern is typical of such systems. Numbers that refer to lengths of sections of Nolan's Cross can signify the numbers of components in any holistic system — for that is the whole point about this arrangement of boulders. It is not its shape that means something, it is just a pattern of numbers (overt and implicit) defined by horizontal and vertical distances between stones. But what a remarkable pattern! These numbers can quantify the properties of *any* holistic system (not necessarily a single, physical object) that possesses *true*, sacred architecture, that is, one that embodies the mathematical archetypes of the Mind of God. That is why they can be found (as Brian Pharoah has revealed in his book "The Secrets of Nolan's Cross") in many cultures and religions, as well as in nature. Scientists and mathematicians stumble across them without realising their true generality and significance. Their universal status is usually recognised in an intuitive way, and they have not been connected to one another by means of a rational, conceptually coherent framework. This article attempts to achieve this in the context of the enigmatic mystery of Nolan's Cross. Analysis of these master numbers in a general context can be found at the author's website.

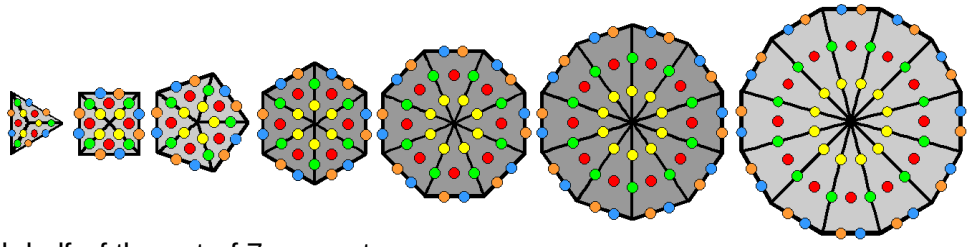


Fig. 25

Each half of the set of 7 separate Type A polygons has 24 corners and 5 sets of 24 hexagonal yods. They symbolise the 120 vertices in each of the two 600-cells whose compound is the orthogonal projection in the H_4 Coxeter plane of the 240 vertices of the 4_{21} polytope that represent the 240 roots of E_8. Each 600-cell is a compound of 5 disjoint 24-cells (25 when some vertices are shared). The 5 sets of 24 hexagonal yods symbolise their 5 sets of 24 vertices.

Triangle, square, pentagon & dodecagon

24 🟡
24 🔵
24 🔴
24 🟡
24 🟢

Hexagon, octagon & decagon

24 🟡
24 🔵
24 🔴
24 🟡
24 🟢

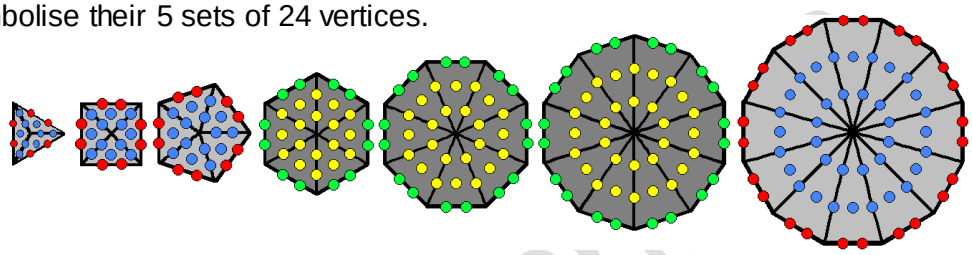


Fig. 26

24×(3 🔵 + 3 🟡) = 24×6 internal hexagonal yods

24×(2 🔴 + 2 🟢) = 24×4 boundary hexagonal yods

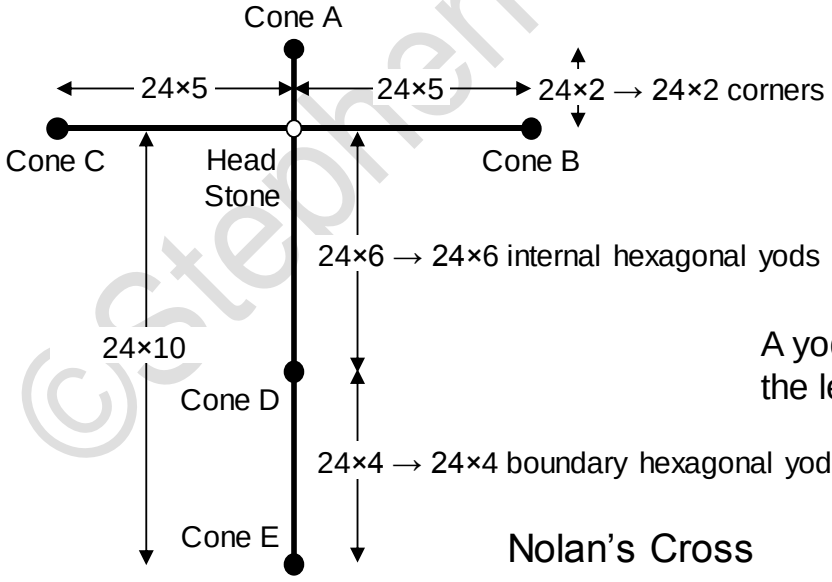


Fig. 27

1 unit = 1 yard

A yod corresponds to the length of one yard

(24+24=48) corners of 7 polygons → (2×24=48) yards between cone A and arm of cross.

24 sets of 6 internal hexagon yods → 24×6 yards between arm and cone D.

24 sets of 4 internal hexagon yods → 24×4 yards between cones D & E.

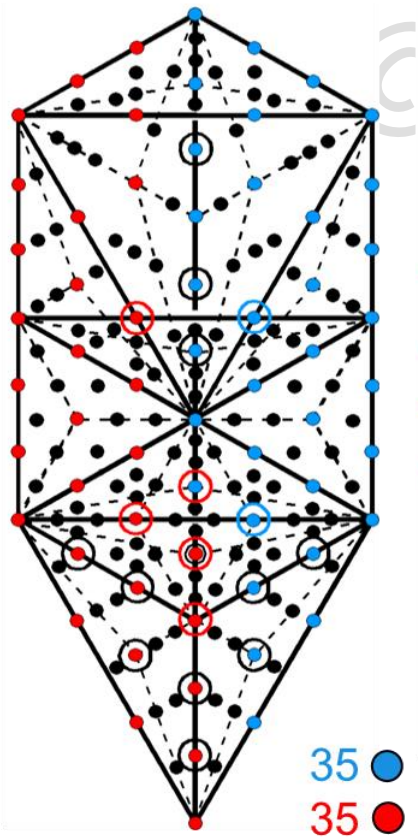
13. Horizontal & vertical arms correspond to the two halves of the inner Tree of Life

The length (288) in yards of the vertical arm of Nolan's Cross corresponds to the 288 yods that surround the centres of the seven separate Type polygons making up either half of the inner Tree of Life. The length (240) in yards of the two horizontal arms (or the vertical arm up to these arms) corresponds to the 240 hexagonal yods in either set of seven polygons. These polygons have 48 corners and can be separated into two groups, each with 24 corners (Fig. 25):

Triangle, square, pentagon & dodecagon hexagon, octagon & decagon

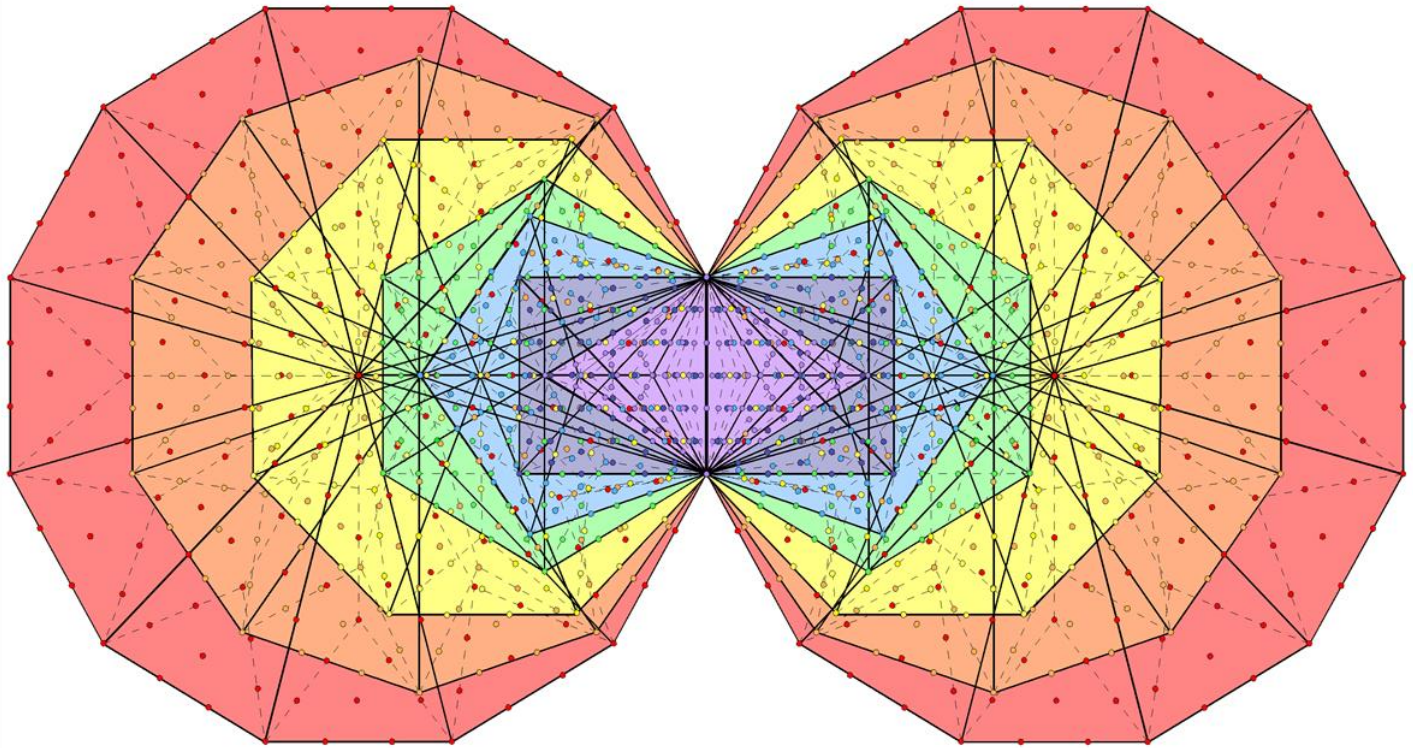
As there are five hexagonal yods per sector, each set has (5×24=120) hexagonal yods. A coloured hexagonal yod is repeated 24 times in each set. This means that the 240 hexagonal yods can be regarded as two sets of five sets of 24 hexagonal yods. They symbolise the two sets of 120 vertices of a 600-cell, each of which is a compound of five 24-cells when they are disjoint, although there are 10 ways of partitioning each 600-cell this way (they form 25 different 24-cells when some vertices are shared). Each set of 24 hexagonal yods (repeated five times) represents the 24 vertices of one of the five 24-cells in a 600-cell.

Of the five hexagonal yods per sector of a polygon, two line each side and three are inside the sector. As each type of hexagonal yod is repeated 24 times in either set of polygons, the 240 hexagonal yods in both sets consist of 24 groups of four boundary hexagonal yods (two from each set) and 24 groups of six internal yods (three from each set) (Fig. 26). The 240 hexagonal yods divide into (24×4=96) hexagonal yods lining sides of polygons and (24×6=144) hexagonal yods that are inside them. As a yod denotes the length of one yard, this distinction between boundary and internal hexagonal yods is marked in Nolan's Cross (Fig. 27) by cone D, which divides the section below its arms of length 240 yards into a section of 144 yards and one of 96 yards. This cone serves to differentiate between the two *classes* of yods — external and internal. The distance of 48 yards between Cone A and the arms of the cross corresponds to the 48 corners of the seven polygons in either half of the inner Tree.



Outer Tree of Life

(circles denote yods in front of/behind another yod)



685 yods Inner Tree of Life 685 yods

35 + 685 = 720 35 + 685 = 720

720 + 144 + 720 = 1584

144 → distance in feet between Cone A and Head Stone
720 → distance in feet between Head Stone & Cone E
720 → distance in feet between Cone B & Cone C

Fig. 28

14. 1584 feet in Nolan's Cross correspond to the 1584 yods in the outer & inner Tree of Life

The outer Tree of Life is composed of 16 triangles with 10 corners and 22 sides. When a triangle is a tetractys, two hexagonal yods line each side. The number of yods in the outer Tree of Life = 10 + 22×2 + 16 = 70. Aligned with its central axis (although not all lying on a straight line) are 16 yods. Because of its mirror symmetry, the remaining 54 yods are arranged as 27 yods on one side of the axis and 27 on the other side. The uppermost eight (coloured blue) of the 16 yods can be associated with the left half of the outer Tree and the lowermost eight (coloured red) can be associated with the right half. The outer Tree can be divided into two mathematical halves, each containing (27+8=35) yods (Fig. 28).

When the 16 triangles are Type A, nine internal yods (coloured black) are added to each one. Eighteen of the 144 new yods are aligned with the central axis, leaving 63 black yods on either side of it. As with their counterparts in the outer Tree of Life with its triangles turned into tetractyses, nine black yods can be associated with each half, so that altogether (8+9+27+63=107) yods can be associated with each half. The outer Tree with Type A triangles contains (2×107=214) yods.

The (7+7) polygons of the inner Tree of Life have 94 sectors. When a polygon is Type B, its sectors are Type A triangles with 10 internal yods. The number of such yods in the inner Tree of Life = 94×10 = 940. Lining the sides of each set of seven enfolded polygons are 120 yods (see Figs. 14, 15 & 19). When the two sets are joined, four yods on the root edge of either set disappear, so that the (7+7) enfolded polygons have (120+120−4=236) boundary yods. The sectors of either set of seven separate polygons have 48 internal sides. When enfolded, the triangle replaces a sector of the hexagon. Two of its sides replace two internal sides of the latter, leaving 46 internal sides, each with two hexagonal yods on it. When they become enfolded, the centre of the decagon coincides with a corner of the pentagon and the centre of the hexagon coincides with a corner of the triangle. This means that five of the seven centres in each set of seven polygons do not belong to the 236 boundary yods. The number of yods in the (7+7) enfolded Type B polygons = 940 + 236 + 46×2 + 46×2 + 5 + 5 = 1370. This can be written:

$$1370 = 1^2 + 37^2.$$

The total number of yods in the separate outer and inner Trees of Life = 214 + 1370 = 1584. Amazingly, *this is the length in feet of the vertical and horizontal arms of Nolan's Cross!*

Associated with the seven enfolded Type B polygons in each half of the inner Tree of Life are (1370/2=685) yods. We saw earlier that each half of the outer Tree of Life built from tetractyses has 35 yods. Each half of both Trees has (35+685=720) yods. Compare this with the horizontal line being 720 ft long and the vertical section below the two arms of the cross being 720 ft long. Moreover, the 144 additional yods in the outer Tree with Type A triangles correspond to the distance of 144 ft between Cone A and the Head Stone. Each yod denotes the length of one foot. Not only is the total length of the lines making up the cross equal to the total yod population of the outer and inner Trees of Life, the three measurements 144 ft, 720 ft & 720 ft that create the shape of the cross have their natural counterparts in the latter.

The number 1584 can be written as

$$1584 = 1600 - 16 = 4(400 - 4) = 4(20^2 - 2^2).$$

$$20^2 = 1 + 3 + 5 + \ldots + 39$$

and $2^2 = 1 + 3$. Therefore,

$$1584 = 4(5 + 7 + 9 + \ldots + 39).$$

This is the sum of (4×18=72) odd integers that can be arranged in a cross. As 1584 = 22×72, assigning the same number 72 to the 22 Paths of the outer Tree of Life generates the length in feet of Nolan's Cross. The number 72 is not only the unit of length that reduces its various dimensions to the integers 1-12 and generates their polygonal representations but it also determines its cross shape in an arithmetic way. As

$$528 = 23^2 - 1 = 3 + 5 + 7 + \ldots + 45,$$

i.e., 528 is the sum of the first 22 odd integers after 1,

$$1584 = 3\times528 = 9 + 15 + 21 + \ldots + 135.$$

$$864 = 3\times288 = 3(17^2-1) = 3(3+5+7+\ldots+33) = 9 + 15 + 21 + \ldots + 99.$$

Therefore, 1584 = 864 + 720, where 864 is the sum of these first 16 odd integers, beginning with 9 and six units apart, and 720 is the sum of the last six odd integers:

$$720 = (105+111) + 117 + 123 + 129 + 135 = 3\times240 = 216 + 504 = 3\times72 + 7\times72.$$

Arithmetically reproduced here is the 72:168 division of the 240 roots of E_8 (see discussion of Fig. 17).

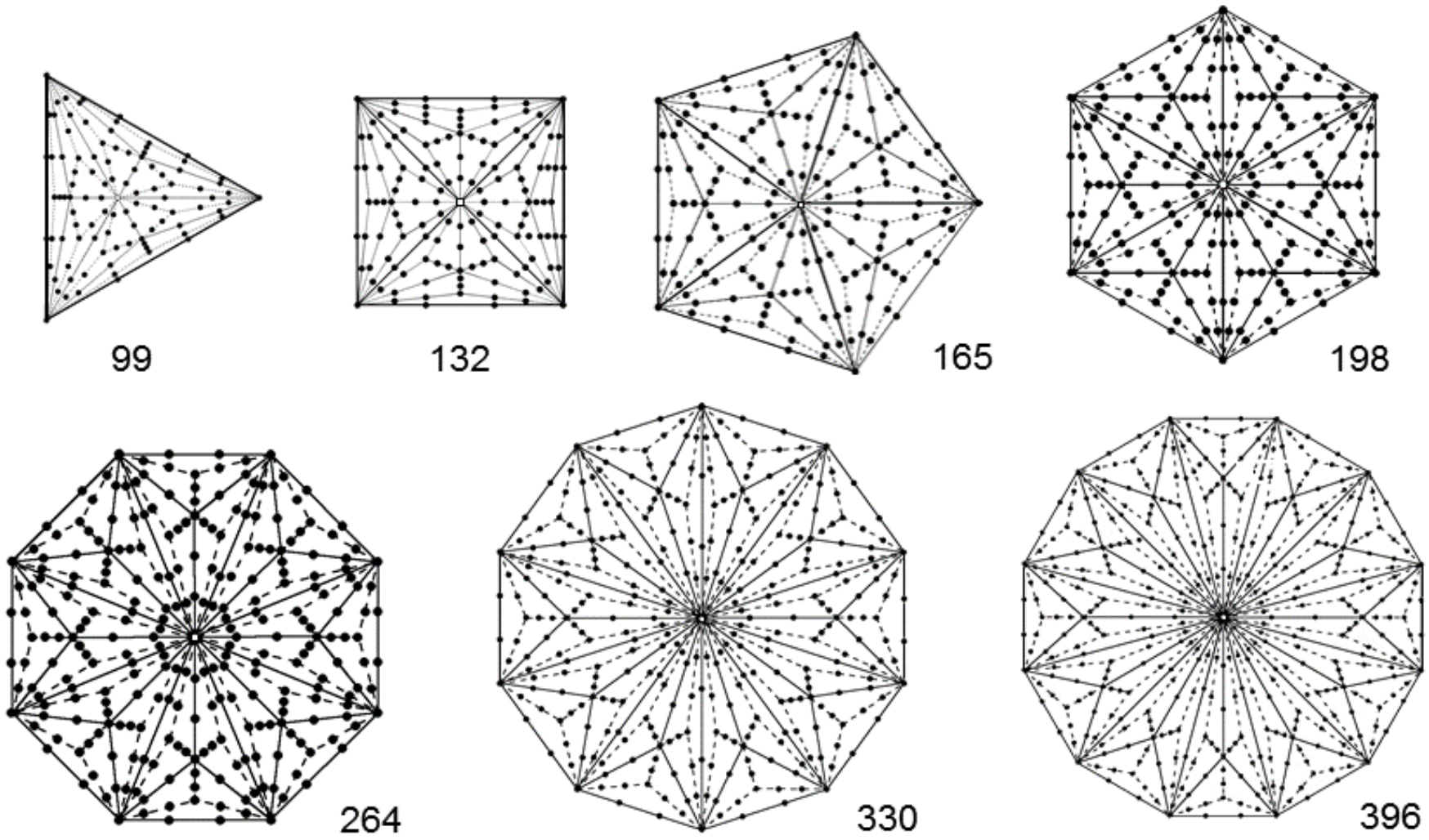


Fig. 29.

Number of yods surrounding the centres of the 7 Type C polygons and lining the 432 tetractyses in their 48 sectors = 48×33 = 1584. This is the total length in feet of Nolan's Cross.

15. 1584 yods surround the centres of the seven Type C polygons, lining their tetractyses

A polygon is Type C when its sectors are Type B triangles with seven corners & 15 sides of nine basic triangles. This means that each sector contributes 28 geometrical elements (5 corners, 14 sides & seven triangles). The numbers of geometrical elements in a Type C n-gon are:

Number of corners ≡ C = 5n + 1
Number of sides ≡ S = 14n
Number of triangles ≡ T = 9n
Total = 28n + 1

("+1" denotes the centre of the polygon). When each basic triangle is a tetractys, the number of hexagonal yods lining sides of tetractyses ≡ H = 2S = 28n. The number of corners of the 9n tetractyses = C = 5n + 1. The number of yods on sides of tetractyses ≡ B = C + H = 33n + 1. The table below tabulates the yod compositions of the seven separate Type C polygons (Fig. 29) that make up the inner form of the Tree of Life ("+7" refers to their seven centres):

	Triangle (n=3)	Square (n=4)	Pentagon (n=5)	Hexagon (n=6)	Octagon (n=8)	Decagon (n=10)	Dodecagon (n=12)	Total
C	16=**15**+1	21=20+1	26=25+1	31=30+1	41=40+1	51=50+1	61=60+1	247=240+7
H	84	112	140	168	224	280	336	1344
B	100=99+1	133=132+1	166=165+1	199=198+1	265=264+1	331=330+1	397=396+1	1591=1584+7

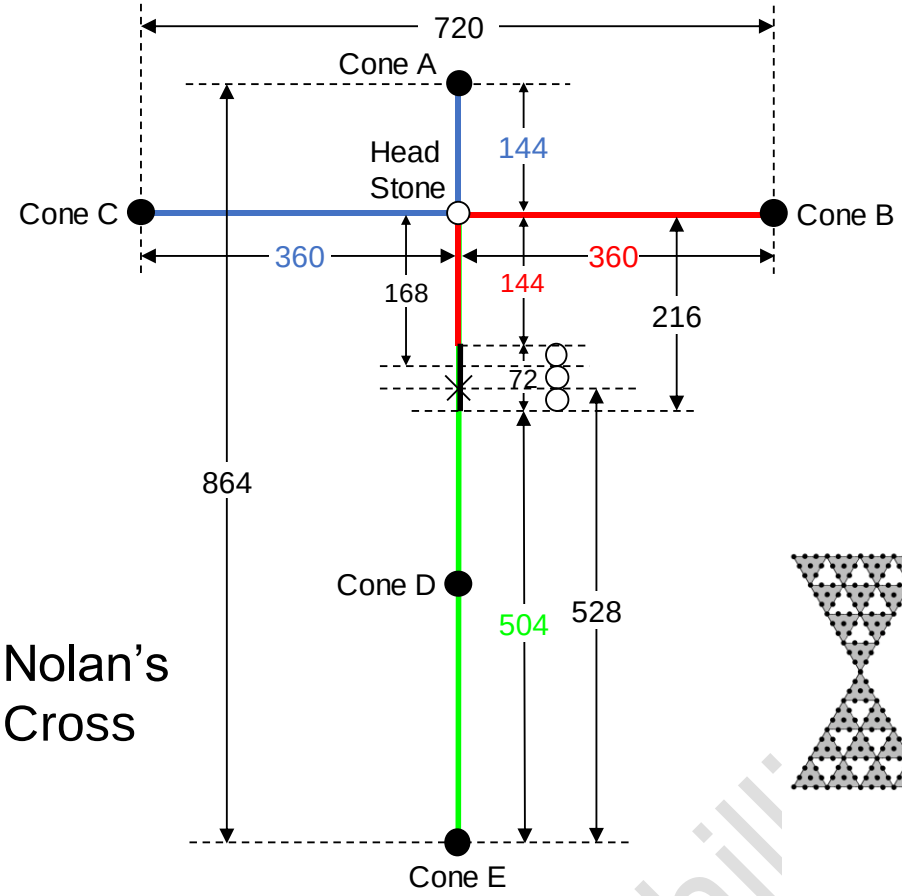
We see that the (9×48=432) tetractyses are lined by 1591 yods, which include the centres of the seven polygons. Hence, (1591−7=1584) boundary yods surround the seven centres. *The number of yods needed to shape all the 432 tetractyses in the seven separate Type C polygons of the inner Tree of Life is the total length of Nolan's Cross in feet; each yod denotes a length of one foot.* Notice that:

$$432 = 3^3 + 4^3 + 5^3 + 6^3.$$

As 528 = 16×33, the 1584 yods consist of three sets of 528 yods because each of the three sets of polygons:

triangle, pentagon & octagon square & dodecagon hexagon & decagon

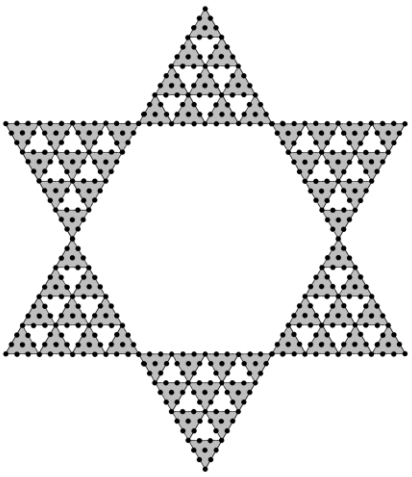
have 16 sectors and therefore 528 yods surrounding their centres. This is also discussed in Fig. 30.



Nolan's Cross

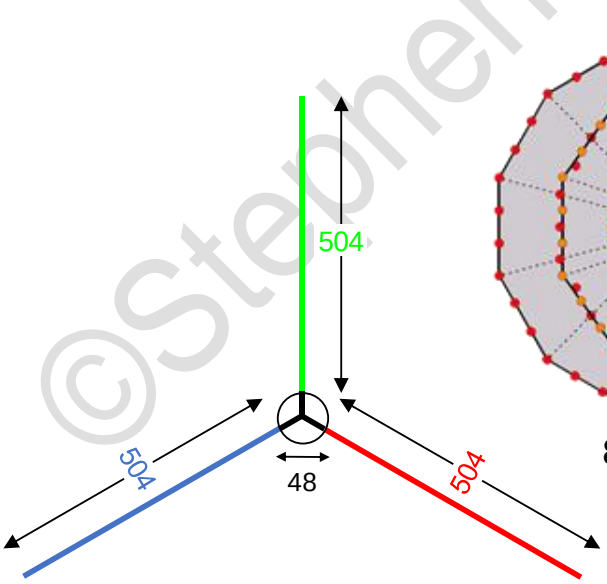
1 unit = 1 foot

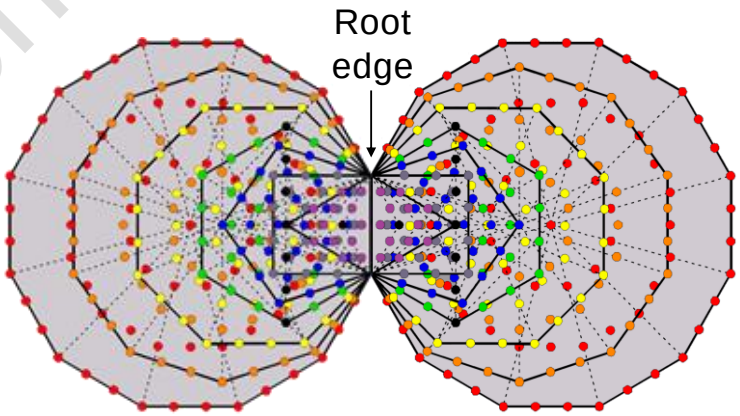
360 + 144 = 504
360 + 144 = 504
504 + 24 = 528



The cross marks where three equal lengths of 528 ft meet

The 6-pointed star has 504 yods





504 unshared yods outside the root edge

A three-fold array of three lines (504+24=528) ft long has the length of the vertical & horizontal lines of Nolan's Cross

Fig. 30

16. The three-fold division of Nolan's Cross and its inner Tree of Life basis

If we divide the length of one mile (5280 ft) into 10 equal distances of 528 ft, the total length in feet of the vertical and horizontal lines in Nolan's Cross = 1584 = 3×528. This is 3/10 of a mile, or 1/10 of a league. The English statute mile was established in 1593 during the reign of Queen Elizabeth I as 5280 ft. The French *lieue* existed in several variants, but it was never *exactly* 1584 ft, whilst the Spanish *legua*, although equivalent to three Spanish miles, was about 2.6 miles, before being abolished in 1568. This consistency with only one of the major sea-faring nations centuries ago is highly significant because it cannot be coincidence that the *predicted length of the cross is exactly one-tenth of the English league*. It strongly suggests that whoever designed Nolan's Cross were English, for many other countries had their own miles that differed slightly from the length of 5280 ft that was established in 1959 as the "international mile," just as they had different leagues. This property of the cross was not intentional. It was just the consequence of working with a system of units of length that had a league of three miles, a yard of three feet and a mile of 5280 feet that was exactly ten times the sacred number 528. These units made it easy to construct a sacred-geometrical object with a three-fold pattern, for then the same number 528 would characterise each one of the three parts of the whole as well the latter itself, only it measured feet, not yards.

The English units of length harmonise with the sacred-geometrical dimensions of Nolan's Cross, which express three-fold and seven-fold properties. A similar 3:7 division manifests in the mathematics of the largest exceptional Lie group E_8, which has 240 (=10×24) roots comprising 72 (=3×24) roots of its exceptional subgroup E_6 and 168 (=7×24) other roots (see Figs. 16 & 17). It appears as the distinction between the Supernal Triad of Kether, Chokmah & Binah and the seven Sephiroth of Construction. In M-theory, which predicts the existence of 10 spatial dimensions, the pattern manifests as the three large-scale dimensions of 11-dimensional space-time and its seven compactified dimensions.

The centres of the seven Type B polygons shown in Fig. 7 are surrounded by 720 yods, each symbolising the length of one foot in the 720-foot long horizontal line between Cone B and Cone C. The two subsets of polygons, each with 24 corners (let us call them S and S′), contain 360 yods; they correspond to the two arms of the cross, each of length 360 ft. When the seven polygons are Type A, there are 144 yods in each subset, 216 yods being added to each when they are Type B. Suppose that length along the vertical line is measured from its upper end. Its upper section of length 144 ft can be associated with one arm (the left one in Fig. 30, coloured blue) and the next section of 144 ft can be associated with the other arm (the right one, coloured red). These two identical lengths of (360+144=504) ft correspond to adding the 360 yods in S to the 144 in its counterpart in the other set of seven polygons, and similarly for S'. This leaves (216+216=432) yods in the other set, corresponding to a section of length 432 ft. There is a final section of 144 ft — the same length as the section above the arms of the cross. Hence,

$$1584 = 504 + 504 + (432+144=576).$$

The fundamental meaning of the number 504 is discussed at the author's website and elsewhere in this article. The yod population of the (7+7) enfolded Type A polygons is 524. Of these, the centres of the triangles coincide with the two hexagonal yods on the line connecting Chesed and Geburah and seven yods lining the vertical axis of each hexagon line the side Pillars of the outer Tree of Life. Outside the root edge are (524−4−8−8=504) unshared yods — yods that are *intrinsic* to its inner form. It can also be understood as the number of yods making up a six-pointed star whose points are 2nd-order tetractyses: 504 = 6×84.

If, instead, we measure the distance 576 upwards from Cone E, then, noting that the number 144 is the sum of the (3×24=72) boundary and the 72 internal yods in either S or S′,

$$576 = (72+72=144) + 216 + 216 = (72+216) + 216 + 72 = (288+216) + 72 = 504 + 72.$$

The distance 288 ft is the distance between Cone E and Cone D. The length 1584 ft (528 yards) consists of three sections of 504 ft (168 yards) and a section of 72 ft (24 yards) denoted in Fig. 30 by a black line. As 24 = 3×8, the 528 yards can be represented as a three-fold array of straight lines 168 yards long that terminate on a circle of radius eight yards, i.e., effectively three lines, each 176 yards (1/10 mile) in length. The point on the vertical line of Nolan's Cross that corresponds to the centre of this array of lines is 176 yards from Cone E. The three black lines in the array, each eight yards long, correspond in Fig. 30 to the three similar, contiguous circles, each 24 ft in diameter, that span the 72 ft-long, black, vertical section that is the core of Nolan's Cross (not its centre of gravity but its spiritual centre).

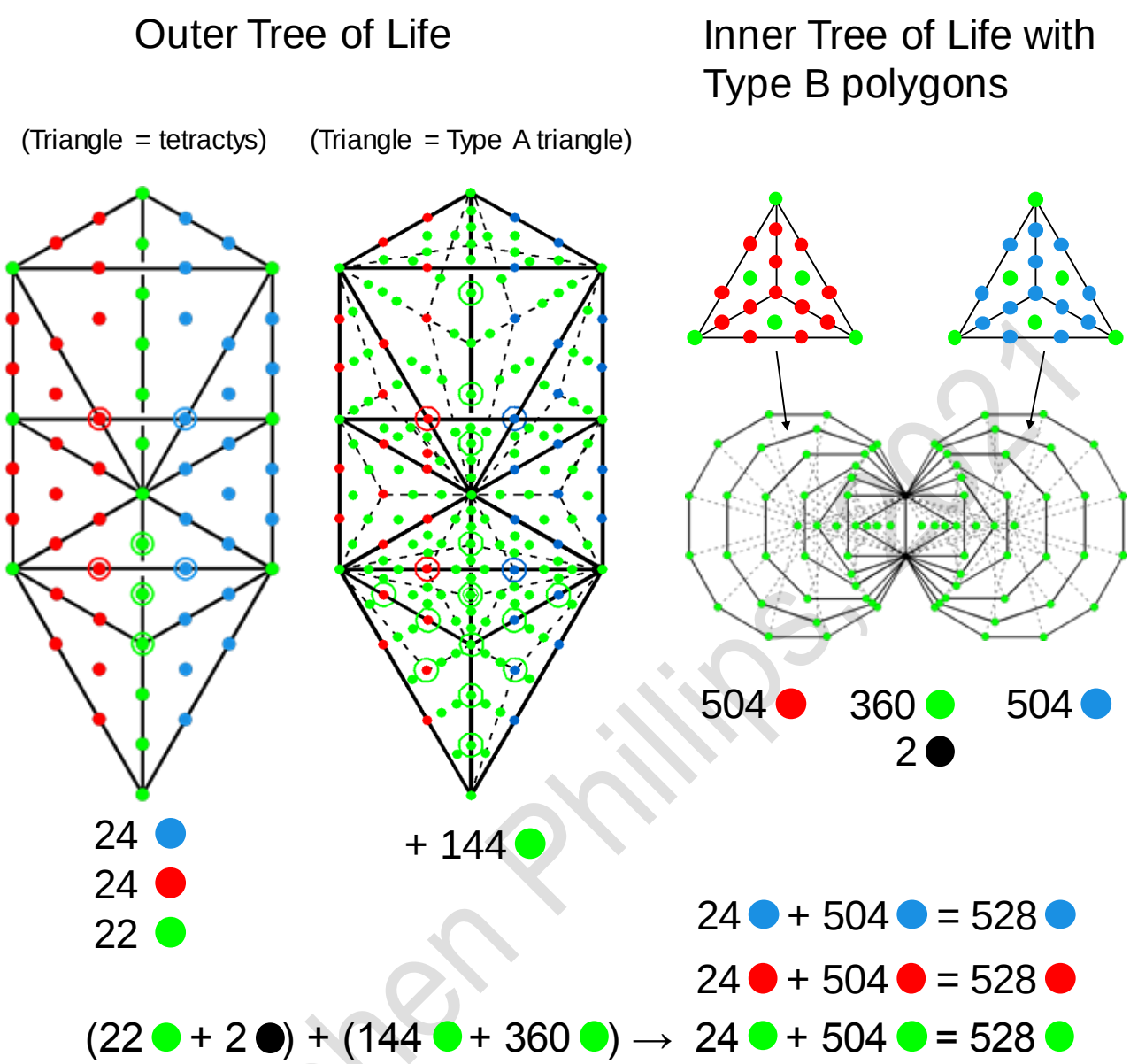
As

$$528 = 23^2 - 1 = 3 + 5 + 7 + \ldots + 45 = (3+45=48) + (5+43=48) + \ldots + (23+25=48)$$

$$= 48 + 5\times48 + 5\times48 = 48 + 240 + 240 = 288 + 240,$$

the total length in yards of the vertical and horizontal arms is the sum of the first 22 odd integers after 1. Two of them add up to the distance of 48 yds between Cone A and the Head Stone, 10 add up to the distance of 240 yds between Cone B and Cone C and 10 add up to the distance of 240 yds between the Head Stone and Cone E.

The number 176 appears in the seven enfolded Type A polygons as the 176 corners, sides & triangles of their 47 sectors (see p. 45). The vertical axis of the hexagon coincides with either side Pillar of the outer Tree of Life. Three corners and two sides of its sectors line the axis. The root edge comprises two corners and one side shared by the 14 polygons in the inner Tree of Life. Hence, five corners and three sides (eight geometrical elements) make up the root edge and the axis of the hexagon. There are (176−8=168) geometrical elements in the seven enfolded polygons outside their shared root edge that are intrinsic to the inner Tree of Life in the sense that they are not part of the outer Tree of Life. The 176 geometrical elements comprise eight geometrical elements that are either part of the root edge or the outer Tree of Life and 168 elements outside the root edge that are intrinsic to its inner form. This 8:168 division manifests in the three-fold array of lines as each black line eight yards long and each coloured line 168 yards long.

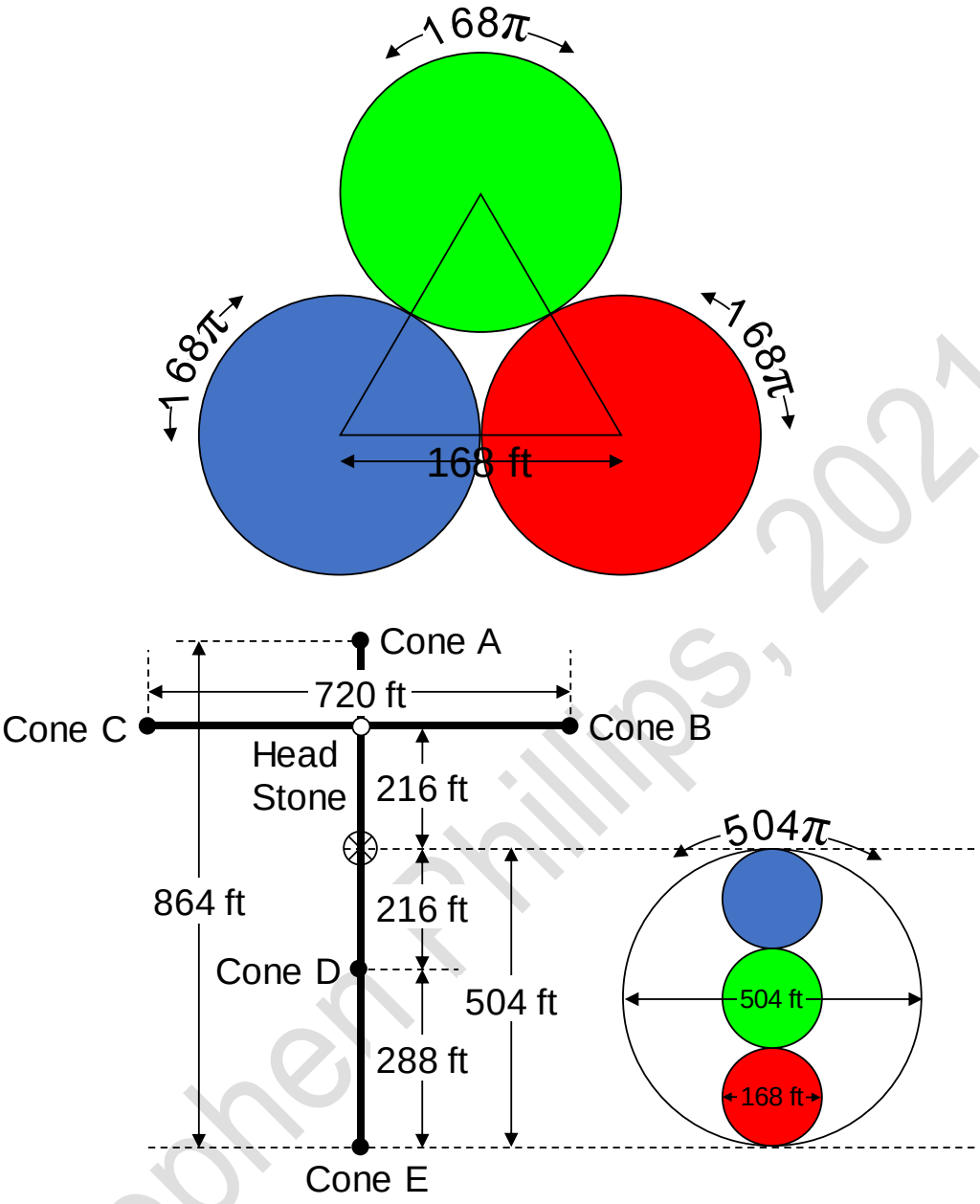


The three sets of (504+24=528) yods in the outer and inner Trees of Life correspond to the three lengths of 528 ft in Nolan's Cross, which has a total length of 528 yards between its stone markers. The 72 yods constituting the outer Tree (70 yods) and its roots (two ● corners shared by all 14 polygons in its inner form) measure the central segment of 72 feet that is surrounded by three segments of length 504 ft.

Fig. 31

17. The three-fold division of Nolan's Cross and its outer & inner Tree of Life basis

The total length of the vertical and horizontal lines in Nolan's Cross is 1584 ft. As we saw in Fig. 28, this is the number of yods in the *separate* outer and inner Trees of Life when the former is composed of 16 Type A triangles and the latter consists of (7+7) enfolded Type B polygons. The triple array of lines (24+504=528) ft long that can represent Nolan's Cross has its counterpart in the outer and inner Trees, indicating that this representation of the cross as three lines, not two, is not arbitrary because it has a Tree of Life basis. When its 16 triangles are tetractyses, the outer Tree of Life contains 70 yods (Fig. 31). Its right-hand side contains 24 blue hexagonal yods, just as its left hand side contains 24 red hexagonal yods because of its two halves are mirror images of each other. Sixteen green yods are aligned with its central axis (Pillar of Equilibrium) and six corners of triangles lie on the two side Pillars. Hence, there are two sets of 24 hexagonal yods, one the mirror images of the other, and a set of 22 yods. When all the triangles are Type A, the outer Tree of Life has 214 yods, i.e., an addition of 144 yods. The (7+7) enfolded polygons have (47+47) sectors with 80 corners. Of these, two corners (denoted by black yods) are the endpoints of the root edge. It can be regarded as the "root" of the outer Tree of Life. Grouping them with the 70 yods that compose its trunk and branches, the 72 yods form three sets of 24 yods. The (7+7) enfolded polygons have (47+47) sectors with 80 corners (78 outside their root edge). When the polygons are Type B, there are three tetractyses in each sector, at the centres of which is one hexagonal yod. The number of these yods in the (7+7) polygons = 3(47+47) = 282. The number of green yods that are either central hexagonal yods or corners outside the root edge = 78 + 282 = 360. Adding them to the 144 extra yods in the outer Tree of Life creates a set of 504 green yods. As the total number of yods in the inner Tree of Life is 1370, the number remaining = 1370 − 2 = 362 = 1008. Associated with each set of seven enfolded polygons are (1008/2=504) yods. They are coloured either red or blue. Not only are there three sets of 24 yods but there are also three sets of 504 yods. Grouping together yods of the same colour, we find that not only is the total yod population of the separate outer and inner Trees of Life 1584, but it also consists of three sets of 528 yods. *They are the counterparts of the three lengths of 528 ft that make up Nolan's Cross*. The three sets of 24 yods making up the outer Tree and its root corresponds to the three segments of length 24 ft that can be regarded as the centre of the three-fold array shown in Fig. 30. This segment of Nolan's Cross (its core) represents the root of the Tree of Life and its outer form, whilst all its other segments represent its inner form. Notice that the length of the red or blue sections is the sum of the length (360 ft) of an arm and the length (144 ft) of a vertical section. The *same* numbers appear in the 144 extra yods in the outer Tree and the 360 yods either at centres of tetractyses in the inner Tree or at their corners! In view of the analogy between the two mirror-image halves of the inner Tree of Life and the two mirror-image sections of 528 ft, it seems appropriate to make the outer Tree and its root correspond to the central section of 72 ft and the three lengths of 504 ft that surround it correspond to the three sets of 504 yods.



Sum of circumferences of 3 circles of diameter 168 feet

$= 3\times168\pi = 504\pi$ feet.

$168\pi \approx 168\times22/7 = 168(3+1/7) = 168\times3 + 168/7 = 504 + 24 = 528.$

$504\pi = 3\times168\pi \approx 3(24+504) = 72 + 1512 = 1584.$

The sum of the circumferences of three touching circles with a diameter of 168 ft is to within 0.04% the intended length (1584 ft) of the two mutually perpendicular lines forming Nolan's Cross. It is also the circumference of *one* circle with a diameter of 168 yards, or 504 ft, that is, a circle that circumscribes a column of three touching circles of diameter 168 ft. The distance between Cone E and the midpoint ⊗ between Cone D and the Head Stone is 504 ft, as is the sum of the distances between the Head Stone and Cone A and between the Head Stone and either Cone B or Cone C.

Fig. 32

18. The length of Nolan's Cross is the approximate, total circumference of 3 circles

Let us consider the combined outer and inner Trees of Life with Type A triangles in the former and Type B polygons in the latter. The n-tree has (158n+93) yods (the proof is in Fig. 13) and the inner form of the Tree of Life has 1370 yods (see p. 30), so that the inner form of the n-tree has (1368n+2) yods. When both forms combine, they share (14n+2) yods, so that the n-tree has (144n+91) unshared yods. The total number of yods in the combined outer & inner forms of the n-tree = 1512n + 93. The 94 Type A triangles in the set of (7+7) polygons enfolded in each Tree have (3×94=282) hexagonal yods at the centres of their tetractyses, so that (1086n+2) yods line the 282n tetractyses in the inner form of the n-tree. Of these, (78n+2) are corners of sectors, leaving 1008n hexagonal yods on sides of 282n tetractyses. There are 504 such hexagonal yods associated with each half of the inner form of every overlapping Tree. The number of yods left in the combined outer and inner forms of the n-tree = 1512n + 93 − 1008n = 504n + 93. It means that 504 yods either belong to every successive Tree or are corners or centres of tetractyses in its inner form. Not only do 1512 yods belong to the combined outer and inner forms of every Tree but they form *three* distinct sets of 504 yods, namely, 504 hexagonal yods lining tetractyses associated with each half of its inner form and 504 yods that are either added by each successive Tree or corners or centres of tetractyses making up its inner form. These three sets of 504 yods correspond in Nolan's cross to the three sections of 504 ft that surround a central section of length 72 ft (see Fig. 30).

Consider three circles of the same radius with their centres located at the corners of an equilateral triangle (Fig. 32). Suppose that the circles touch one another and that the length of each side of the triangle is 168 units (it does not matter what these units are). As the diameter of each circle is 168 units, its circumference is 168π units, where π = 3.14159… . People in the ancient world knew of pi but worked with various approximations of its exact magnitude. The great, ancient Greek mathematician Archimedes (c. 287 – c. 212 BCE) calculated upper and lower bounds for pi. He found that its upper bound was 22/7. This may have led to the widespread belief that pi was equal to 22/7 (= $3^1/_7$). This is almost true, for this number is within 0.2% of its precise value. Working with this approximate value, the circumference of each circle ≈ 168×(22/7) = 168×($3+^1/_7$) = 504 + 24 = 528. The sum of the circumferences of the three circles = 3×168π = 504π ≈ 504($3+^1/_7$) = 3×504 + 72 = 1584. We see that the well-known approximation to pi allows a natural representation of the number 1584 in terms of the 1584 units of distance approximately making up the circumferences of three circles of diameter 168. Compare it with the exact value 1583.36… of 504π. The difference is only about 0.04%, or one in 2500! A *single* circle of diameter 168 yards, or 504 ft, is approximately 1584 ft in circumference. The author has revealed in his website and in his last book the Kabbalistic and superstring meanings of the numbers 168 and 504. Indeed, the former number has been discussed here, for it is the number of roots of E_8 that do not belong to its exceptional subgroup E_6 (see Fig. 17). It is the distance in yards of Cone E from the midway point ⊗ between Cone D and the arms of the cross. The latter number is this distance in feet. The point is not an arbitrary one but is naturally determined from the various distances set by the stone markers, including the so-called "Head Stone."*

If, as many have done, we conjecture that treasure might have been buried at the site of Nolan's Cross on Oak Island, this formation may *not* have served to provide a clue to its location for anyone to find it (in the author's opinion, the site builders would never have wanted that. Why would they help strangers to become wealthy?). Instead, it was meant to be a form of arcane reference that would enable only themselves or their agents to retrieve it whenever (or if ever) they wished. One can argue in a thousand ways for one's preferred choice of burial spot; the exercise seems worthless. Maybe, however, the builders selected the centre of gravity of the formation of five boulders.* If one makes the reasonable assumption that they intended all boulders to weigh the same, the centre of gravity of the cross is the point about which the moments of their weights W balance. Letting this be distance X measured from Cone E along the vertical line leading to Cone D, then

$$WX + W(X-288) = W(720-X) + W(720-X) + W(864-X),$$

i.e., X = 518.4 ft, which is 230.4 ft beyond Cone D. An alternative, more Kabbalistic candidate that still represents a "centre" of the formation of stones is indicated in the three-fold representation of the number 1584 shown in Fig. 30. As each line is 528 ft long, the vertical one that starts at Cone E must terminate at the point that corresponds to the centre of the three-fold array. It is marked in Fig. 30 by a cross. One of the two line segments of length 24 ft above this point belongs to the pair of lines ⌟ and the other belongs to the pair of lines ⌜. Because the number 528 has its origin as a global parameter of the outer and inner Trees of Life, this seems to be the more likely candidate for a spot where treasure might be buried, if, indeed, any exists at all, for there is no evidence that suggests that it does.

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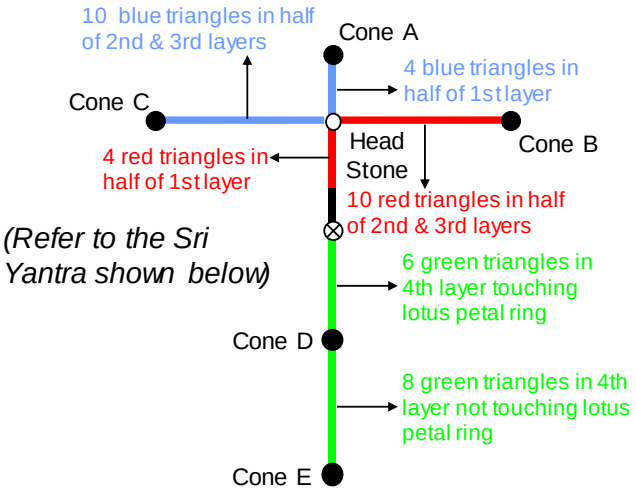
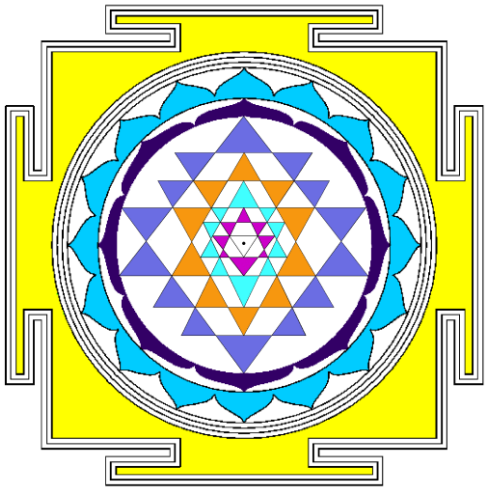
* This slab of sandstone does not have the primary, *architectural* status of the five "Cones." It is redundant as far as marking the *form* of the cross, serving only to indicate the spot where the vertical and horizontal sections of the cross intersect. It emphasizes that this point is *midway* between Cones B and C.





The Sri Yantra

Three sections of length 504 ft correspond to three sets of 14 red/green/blue triangles with 504 boundary yods

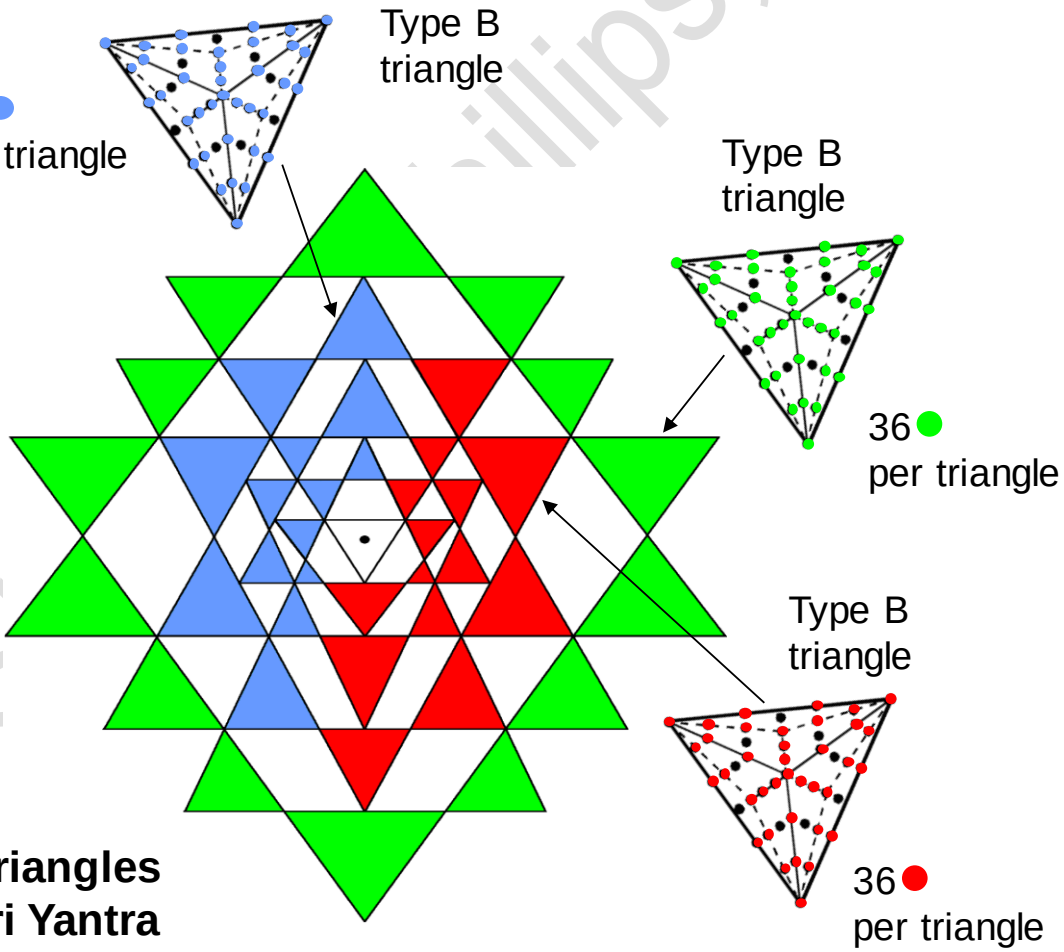


Fig. 33

The 43 triangles of the Sri Yantra

14 △ → 14×36 ● = 504 ●
14 △ → 14×36 ● = 504 ●
14 △ → 14×36 ● = 504 ●

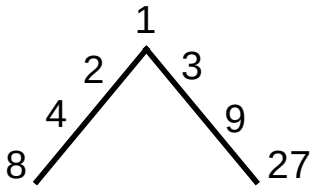
19. Correspondences between Nolan's Cross and the 3-dimensional Sri Yantra

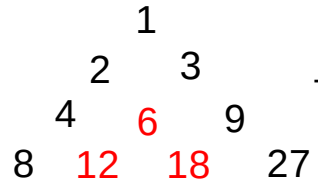
In the Tantric tradition of Hinduism, the Sri Yantra is the most celebrated of the yantras, or mystical diagrams used as aids for worship and meditation. Formed from nine primary triangles, it consists of a central triangle surrounded by 42 triangles. There are both two-dimensional and three-dimensional versions of their arrangement in space. In the latter, they lie in four parallel planes. The topmost sheet has eight triangles (coloured violet in Fig. 33), the sheet next below it has 10 triangles, as does the third sheet, and the fourth sheet has 14 triangles. Surrounding the 43 triangles of the Sri Yantra is an outer ring of 16 petals representing a lotus (they are coloured blue in Fig. 33). It is called the *Sarvasa Paripuraka*. The inner lotus of eight petals (coloured indigo) is called the *Sarva Samkshobahana*. Notice that the inner ring of eight petals touch eight of the outer ring of 16 petals, so that eight blue petals are untouched, being midway between successive indigo petals. Six of the 14 triangles in the lowest layer touch the inner ring of eight petals.

The 28 triangles in the uppermost three layers form two sets of 14 (coloured red and blue) that can be associated with each half of these layers. The 42 triangles that surround the central one consist of three sets of 14 (coloured, red, blue & green). The red set is the mirror image of the blue set, whilst the green set is identical to its mirror image. Of the 46 yods in the Type B triangle, nine are hexagonal yods at centres of nine tetractyses, leaving 37 yods that line their 15 sides. Each triangle has two corners that are corners of its two adjacent triangles in the same layer. This means that there are 36 boundary yods per triangle in the three-dimensional Sri Yantra. Each set of 14 triangles has (14×36=504) yods lining their (9×14=126) tetractyses. The total number of yods that *shape* the 42 triangles surrounding the central one = 3×504 = 1512. They correspond to the 1512 feet in the three sections of 504 ft in Nolan's Cross that surround its core section of 72 feet.

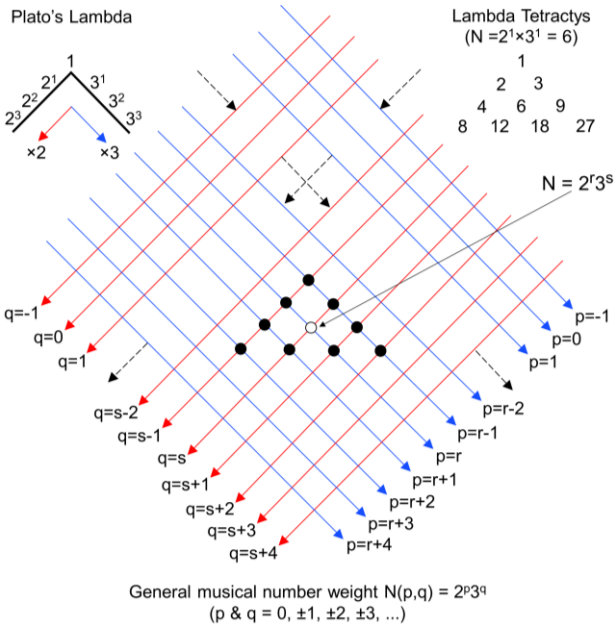
Of the 14 red or blue triangles in the uppermost three layers, four belong to the first layer and 10 belong to the second and third layers. The 504 boundary yods in each set of 14 triangles consist of (4×36=144) yods in the first layer and (10×36=360) yods in the second and third layers. Compare this with the fact that both Cone B and Cone C are 360 ft from the Head Stone, which is 144 ft from Cone A and 144 ft from the beginning of the black line that indicates the section of length 72 ft (Fig. 30). The two halves of the second and third layers with 360 yods therefore correspond to the two halves of the arms of the cross, each of length 360 ft, whilst the two halves of the first layer, each with 144 yods, correspond to the vertical sections of 144 ft above and below the Head Stone. The 14 green triangles in the fourth layer comprise six triangles that touch the ring of eight lotus petals and eight that do not. The latter triangles have (8×36=288) yods that correspond to the 288 ft between Cone E and Cone D, whilst the former have (6×36=216) yods that correspond to the distance of 216 ft between Cone D and ⊗, the midway point between this Cone and the Head Stone. The 42 triangles of the Sri Yantra that surround its central one divide naturally into three sets of 504 yods that correspond to the 504 feet in each of the three primary sections of Nolan's Cross that surround the central one of length 72 ft. The central triangle in the Sri Yantra (or, rather, its three corners) expresses the triple Godhead, or trimurti, of Brahma, Vishnu & Shiva. Transformed into a 2nd-order tetractys, it has 85 yods, of which 75 yods line its ten tetractyses. Given the three corners that define the central triangle, 72 more yods are needed to *shape* these tetractyses. They can be identified with the central core section in Nolan's Cross that is 72 ft long. Transformed into Type B triangles, the Sri Yantra is isomorphic to it in the sense that every yod lining the 378 tetractyses in its 42 triangles symbolises a length of one foot, the second and third layers of triangles accounting for the arms of the cross and the first and fourth layers accounting for its vertical length, apart from the core section of 72 ft, whose counterpart is the central triangle shaped by 72 yods.

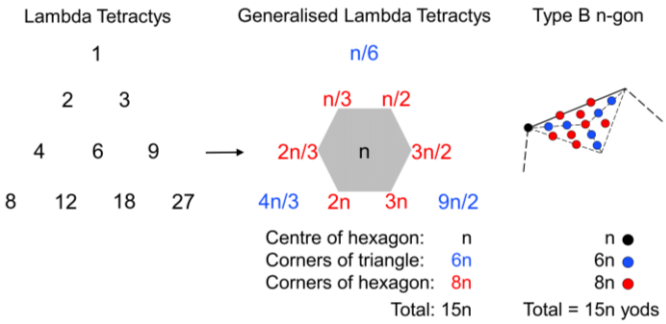
Plato's Lambda





The Lambda Tetractys





The Type B n-gon is a representation of the generalised Lambda Tetractys

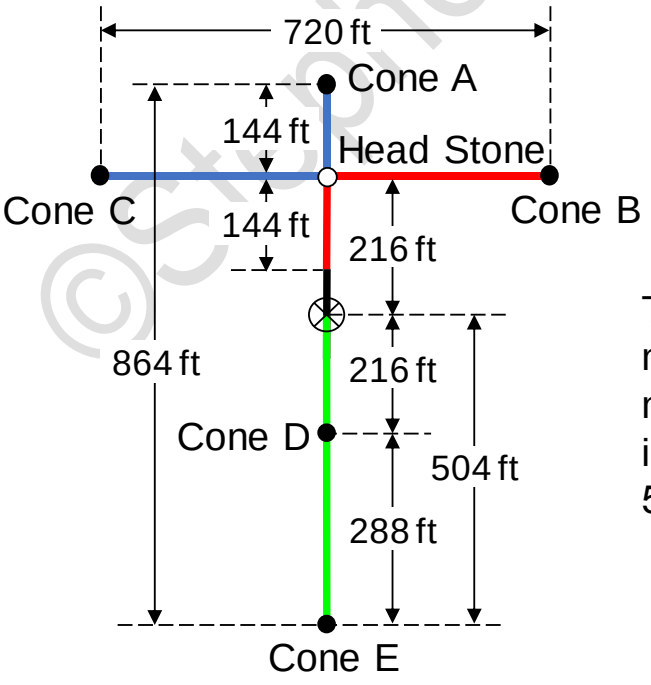
Generalisation of the Lambda Tetractys

18

36 54

72 108 162 = 14×108 = 1512

144 216 324 486



18 + 486 = 504

36 + 144 + 324 = 504

54 + 72 + 162 + 216 = 504

504 + 504 + 504 = 1512

The sum (1512) of the musical number weights surrounding the number weight 108 is the length in feet of the three sections of 504 ft in Nolan's Cross.

Fig. 34

20. Musical aspects to Nolan's Cross

According to Plato's *Timaeus*, his treatise on cosmology, God fashioned the celestial sphere by creating a strip of the World Soul, then bending it to create the shape of the Greek Letter lambda (Λ) and marking out on one side lengths equal to the first four members (integer powers of 2) of the infinite geometric series:

$$1, 2, 4, 8, \ldots$$

and on the other side lengths equal to the first four members (integer powers of 3) of the infinite geometric series:

$$1, 3, 9, 27, \ldots .$$

This so-called "Platonic Lambda" of seven integers is but two sides of a triangular array of 10 integers wherein the three extra ones (coloured red in Fig. 34) are interpolated from their neighbours by following the same multiplication by factors of 2 and 3. This is the Lambda Tetractys. This has long been known to students of music as an array of number weights whose various ratios generate the tone ratios of the notes of the Pythagorean musical scale. Every horizontal and inclined row of the tetractys can be extended indefinitely, forming an infinite, two-dimensional, hexagonal lattice of numbers of the form 2^p3^q, where p & q = 0, ±1, ±2, ±3, etc. If we pick out a tetractys pattern of 10 new numbers with the integer n at its centre (denoted by the nine black dots and the central white dot), their mutual ratios will be the same as those in the original one because every one of these numbers has been changed by the same proportion: N→N′= Nn/6, so that N′/N = n/6. The nine numbers lining the three sides of the new tetractys have the values shown in Fig. 34. The sum of all 10 numbers in the new tetractys is 15n, so that the nine numbers surrounding its central integer n add up to 14n. Compare this with the fact that the Type B n-gon has 15n yods surrounding its centre (n corners of the polygon and 14n yods). If we pick out any integer n in the infinite array of musical number weights, the nine numbers immediately surrounding it add up to the number of yods other than its corners that surround the centre of the Type B n-gon. Any overtone with integer tone ratio n can be associated with a Type B n-gon.

The eight notes of one octave of the Pythagorean scale have the tone ratios:

$$1 \qquad 9/8 \qquad 81/64 \qquad 4/3 \qquad 3/2 \qquad 27/16 \qquad 243/128 \qquad 2$$

In the C major scale, the 48th note is note A of the seventh octave with tone ratio 108. It is the 21st harmonic and the 20th overtone (see p. 6 of Article 12). As $432 = 3^3 + 4^3 + 5^3 + 6^3$, $108 = 432/4 = ¼(3^3+4^3+5^3+6^3)$, i.e., the number 108 is the arithmetic mean of the cubes of the four consecutive integers 3, 4, 5 & 6 that are the numbers of corners of the *first* four polygons. Its nine closest neighbours add up to 108×14 = 1512. This is the length of the three segments of 504 ft in Nolan's Cross (coloured red, green & blue in Fig. 34) that surround a central segment of length 72 ft denoted by the black line starting at ⊗, the point that is midway between Cone D and the Head Stone. Notice that number weights exist in the tetractys with 108 at its centre that add up *separately* to three instances of the number 504, as required. Notice also that:

1. the sum of the integers at its corners = 18 + 144 + 486 = 648, which is the length in feet of the vertical line below the arms of the cross, excluding the central segment of 72 ft denoted by the black line, and
2. the sum of the integers at the corners of the hexagon = 36 + 54 + 72 + 162 + 216 + 324 = 864, which is the sum of the distances between Cone B & Cone C and between Cone A and the Head Stone.

This indicates that the 3:6 division of the nine Sephiroth above Malkuth, which is the counterpart of this pattern in the tetractys, distinguishes the vertical length *below* the arms of the cross from the rest of it.

The length of 1512 ft can be represented by nine identical integers 168 (the arithmetic mean of the nine musical number weights discussed above):

$$1512 = \begin{array}{c} 168 \\ 168 \quad 168 \\ 168 \qquad 168 \\ 168 \quad 168 \quad 168 \quad 168 \end{array}.$$

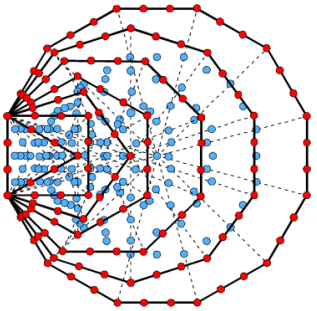
168 is, however, not a musical number weight of the Pythagorean scale because it is not of the form 2^p3^q. The total length (1584 ft) can also be represented by nine identical numbers 176:

$$1584 = \begin{array}{c} 176 \\ 176 \quad 176 \\ 176 \qquad 176 \\ 176 \quad 176 \quad 176 \quad 176 \end{array}.$$

But 176, too, is not a musical number weight because it is not of the form 2^p3^q. It is the number of points, lines & triangles in the seven enfolded, Type A polygons of the inner Tree of Life, whilst 168 is the number of these geometrical elements outside the root edge that are unshared with the outer Tree of Life (see p. 34). This nine-fold array is generated by the arithmetic fact that $1584 = 3\times528$, where $528 = 23^2 - 1 = 3 + 5 + \ldots + 45$, so that

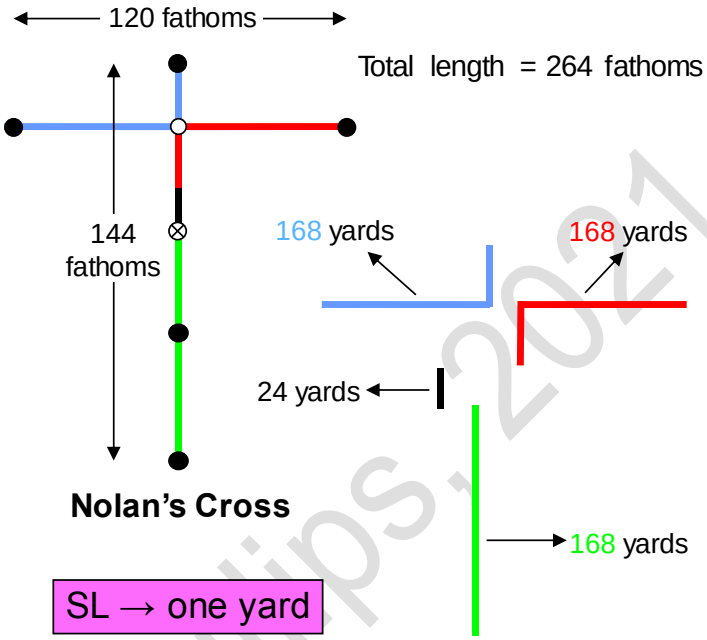
$$1584 = 3(3+5+7+9) + 3(11+13+15+\ldots+45) = 3(3+5=8) + 3(7+9=16=2\times8) + (33+135) + (39+129) + \ldots + (81+87)$$

$$= 3\times8 + 3\times2\times8 + 168 + 168 + \ldots + 168 = (3+6=9)\times8 + 9\times168 = 9\times(8+168) = 9\times176.$$

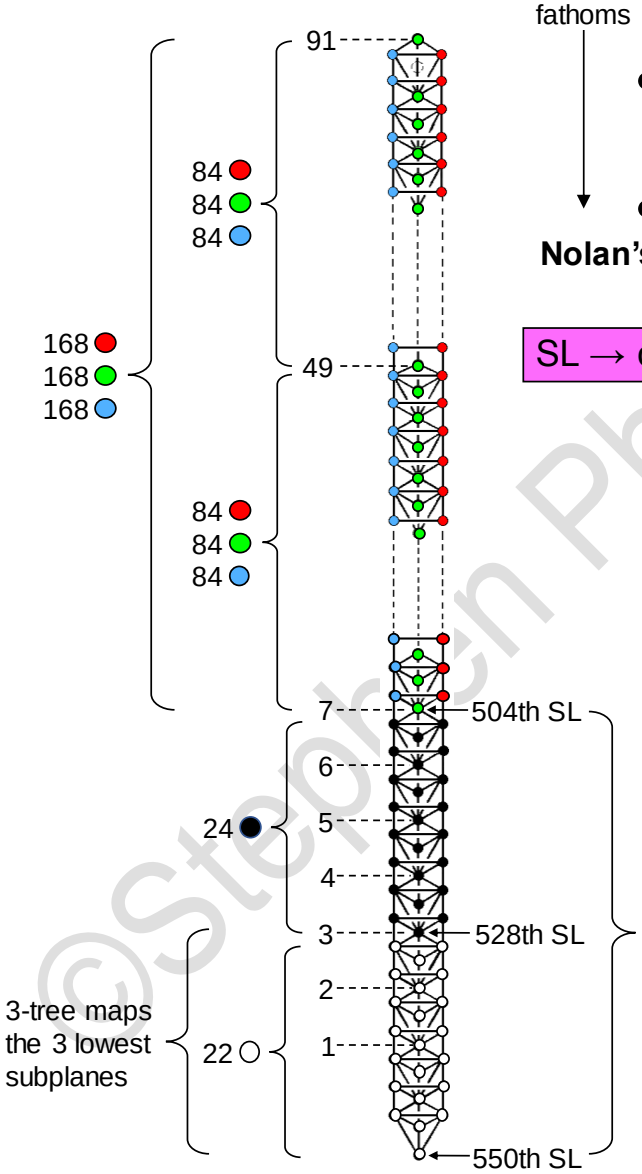


Boundary: 120
Internal: 144
Total = 264

7 enfolded polygons have 41 corners of 47 triangular sectors with 88 sides.
Number of yods = (41+47=88) + 2×88 = 3×88 = 264.
Each yod symbolises one fathom (two yards) of distance.



SL → one yard



The three 168-yard sections that surround the 24-yard section in Nolan's Cross correspond to the three columns of 168 SLs that extend down to the top of the 7-tree mapping the physical plane; this point is 24 SLs above the top of the 3-tree mapping the three "dense physical" subplanes of the physical plane.

24 + 504 = 528

22 + 528 = 550

Nolan's Cross is a representation of the 528 SLs of the 88 Trees of Life in CTOL above the three lowest Trees that map the large-scale physical universe

Fig. 35

21. Nolan's Cross as a map of all higher levels of reality

The author has shown here how — like the DNA molecule encoding instructions for the development of a life form from a single cell — the inner form of the Tree of Life contains information on how its outer form replicates itself to map all levels of reality. What follows is a very brief summary of his discovery. The total number of Sephirothic emanations (henceforth called "Sephirothic levels," or SLs) up to the top of the highest Tree in n overlapping Trees of Life (Y(n)) or to the top of the nth Tree in N Trees of Life (Y′(n)), where n<N, is

$$Y(n) = 6n + 4 \qquad Y'(n) = 6n + 5.$$

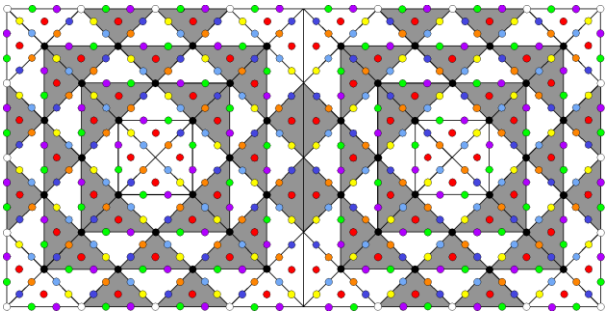
In either case, there are (6n+1) SLs up to Chesed (first Sephirah of Construction) of the nth Tree, each successive Tree having six SLs. A Type A n-gon contains (6n+1) yods, each sector contributing six yods. It is isomorphic to the section of n Trees up to Chesed of the nth Tree. The number "1" denotes the centre of the n-gon and corresponds to Malkuth of the 1-tree. If we consider m different polygons with a total of M corners, then their total number of yods = 6M + m. This is of the form 6M′ + 1, where M′ is an integer, only if m = 6p + 1 (p = M′ – M = 0, 1, 2, 3, etc). The simplest, non-trivial case is where p = 1, i.e., m = 7. This applies to the seven regular polygons making up each half of the inner Tree of Life (see Fig. 7). They have 295 yods that correspond to the 295 SLs up to Chesed of the 49th Tree. Half of the inner Tree of Life therefore encodes for replication of Trees up to this SL. But we are really interested in seeking a *complete* set of N Trees whose SL population Y(N) = 6N + 4 equals the yod population of some subset of the polygons present in the inner Tree of Life, for it does not make sense to look for a partial set. This means that a set of m polygons (7≤m≤14) with N′ corners must be found such that 6N′ + m = 6N + 4. The only solution is m = 10, although m = 4, 10, 16, etc is allowed in general. Together with the seven polygons in one half of the inner Tree, the three polygons with the largest numbers of corners has the same number of yods as 79 Trees of Life have SLs. However, although rigorous, this result is true for *any* set of 10 polygons, whether they belong to the inner Tree of Life or not, and therefore it is not relevant to the task at hand. The solution m = 10 has the weakness that four yods belonging to the other half of the inner Tree of Life would represent the remaining four SLs up to the top of the 49th Tree, i.e., the latter would span the conceptional crossover to the second half. This is counterintuitive, particularly as (as we shall point out shortly) Trees above the 49th one map realities conceptually different to Trees 1-49. Suppose that we consider the two sets of separate polygons to be separated by the root edge with four yods that correspond to these four SLs. Then we look for m polygons (1≤m≤7) with N′ corners in the *second* set of seven polygons whose yod population (6N′+m) is the SL population of N Trees of Life:

$$6N' + m + 4 + 295 = 6N + 4,$$

i.e., m + 295 = 6(N−N′). The only solution is m = 5. The five polygons with the largest yod populations are the pentagon, hexagon, octagon, decagon & dodecagon with 41 corners and 251 yods. Together with the seven polygons and the root edge separating them, the total yod population = 251 + 4 + 295 = 550, corresponding to the 550 SLs in 91 Trees of Life (we call this the "Cosmic Tree of Life," or CTOL). Together with the root edge, one half of the inner Tree of Life maps the lowest 49 Trees and the five largest polygons in its other half maps 42 more Trees. For more details of how sacred geometries embody CTOL, see the various sections listed here.

Theosophy teaches that there are seven cosmic planes of consciousness. Each plane has seven divisions, or subplanes. In the cosmic physical plane (the lowest cosmic plane) these subplanes are further divided into seven, so that it has (7×7=49) subplanes. The six cosmic superphysical planes have (6×7=42) subplanes. Representing each of the 91 subplanes by a Tree of Life establishes contact between Theosophy and the Kabbalistic context. One half of the inner Tree maps the 49 subplanes of the cosmic physical plane and five of the seven polygons in its other half map the 42 subplanes of the six cosmic superphysical planes in the sense that their 251 yods symbolise the 251 SLs in the 42 Trees mapping these subplanes.

According to Theosophy, the lowest plane of consciousness is the physical plane. It has three "dense physical" subplanes that contain all material forms of life, and four "etheric" subplanes that contain elemental life-forms that have played a rich part in the folklore of most countries for many centuries. As far as most humans at the present stage of evolution are concerned, the (91−3=88) subplanes represent levels of awareness beyond the physical universe described by the five senses and the scientific instruments that extend them. Four of them, although part of the invisible realms, are, strictly speaking, still part of the physical plane, which is the material universe in the most general sense of the word 'material'. This leaves 84 subplanes of 12 superphysical planes that denote non-physical states of being. They are mapped by the 84 Trees of Life above the 7-tree, which maps the physical plane. As the number of SLs in n Trees = 6n + 4, these Trees have (6×84=504) SLs that are arranged as 168 SLs on each pillar of CTOL down to the top of the 7-tree. The next four Trees down to the top of the 3-tree have (4×6=24) SLs, so that the total number of SLs in CTOL down to this point = 24 + 504 = 528, where 504 = 3×168. *This is the very pattern that is found in Nolan's Cross* (Fig. 35). Three sections of 168 yards surround a central segment 24 yards long that extends beyond the midpoint ⊗ of the distance between the Head Stone and Cone D. It terminates at a point (168+24=192) yards from Cone E and 48 yards from the Head Stone. The 24 yards of the central segment map the 24 SLs in the four Trees that map the four etheric subplanes. They should be regarded as divided into three sections of eight yards in analogy to the eight SLs in these Trees on each pillar. Each of the three sections of 168 yards express the 168 SLs on each of the three pillars of CTOL down to the top of the three lowest Trees that map the three dimensions of space extending throughout the physical universe visible to the human brain. Nolan's Cross is a remarkably simple but precise representation of all levels of reality that are outside of Einstein's 4-dimensional space-time continuum. It uses merely the lengths of straight lines to express archetypal numbers found in many cultures and religions because they parameterise what is the divine mathematics of the architecture of all realms of existence.



550 yods =
528 { 480 hexagonal yods
48 ●
22 ○

Fig. 36

550 yods outside the shared side surround the centres of two joined squares with 2nd-order tetractyses as their sectors. They symbolise the 550 SLs of CTOL. The 80 1st-order tetractyses have 70 corners and 480 hexagonal yods outside the shared side (240 hexagonal yods in each square). The 70 corners comprise 22 ○ corners on the sides the square and 48 ● internal corners (24 in each square). This 22:24:(24+480=504) pattern appears in CTOL as the 22 SLs below the top of the 3-tree mapping the three dense physical subplanes, the 24 SLs in the next four Trees mapping the four etheric subplanes and the 504 SLs down to the top of the 7-tree mapping the physical plane. The 528 yards of Nolan's Cross consist of the 504 yards of the three segments of 168 yards and a core section of 24 yards.

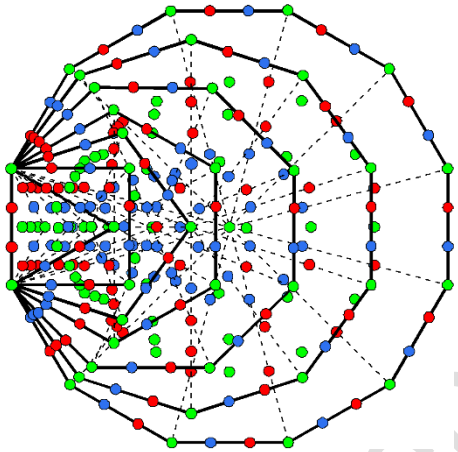


Fig. 37

88 ● hexagonal yod on side of tetractys
88 ● corner or hexagonal yod at centre of tetractys
88 ● hexagonal yod on side of tetractys
264

The 264 yods in the 7 enfolded polygons form three natural sets of 88 yods. In the context of Nolan's Cross, a yod symbolises a fathom (2 yards). The factorisation 88×3×2 corresponds to the 88 pairs of triads of SLs in the 88 Trees of Life in CTOL that are above the lowest three Trees mapping the three dense physical subplanes (the three large-scale dimensions of the physical universe).

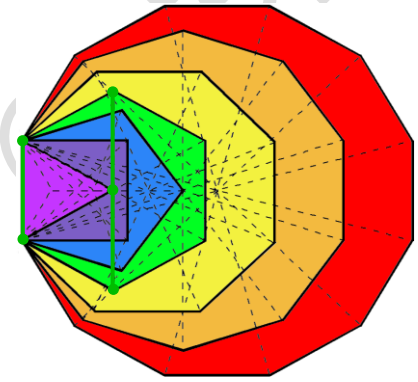


Fig. 38. Five green corners and three green sides of triangles either belong to the root edge or are shared with the outer Tree of Life.

The 7 enfolded Type A polygons (Fig. 38) have 41 corners & 88 sides of 47 triangles (176 geometrical elements). The top, centre & bottom of the hexagon and the two lines joining them are shared with the outer Tree of Life. Outside their root edge are 36 corners, 85 sides & 47 triangles that are intrinsic to the inner Tree of Life, i.e., 168 unshared geometrical elements.

$$176 = 8 + 168.$$

This 8:168 division manifests in the 176 SLs on each pillar of CTOL down to the 3-tree as the 168 SLs down to the 7-tree and the 8 more SLs down to the 3-tree. The division:

$$528 = 3\times176 = 3(8+168) = \ 24 + 504$$

is a Tree of Life pattern. That is why it *must* exist in Nolan's Cross as the central segment of 24 (3×8) yards and three segments of 168 yards, i.e., as three sets of 176 yards. It is why its *total* length had to be 3/10 mile, because a mile is 1760 yards. The "3" expresses the hidden three-fold division of the cross.

22. 88:88:88 and 8:168 divisions compared with the inner Tree of Life

There are 72n yods surrounding the centre of an n-sided polygon with 2nd-order tetractyses as its sectors (see p. 4). The number of corners of the 10n 1st-order tetractyses that surround its centre is 10n. For the square (n = 4), 288 yods surround its centre, where

$$288 = 1^1 + 2^2 + 3^3 + 4^4 = 1!\times 2!\times 3!\times 4!.$$

They comprise 40 corners of 40 1st-order tetractyses and 248 hexagonal yods. The 13 yods lining one side consist of five corners and eight hexagonal yods. The 275 yods outside this side consist of 35 corners and 240 hexagonal yods. Two joined squares constructed from 2nd-order tetractyses have (2×275=550) yods outside their shared side; they comprise 70 corners and 480 hexagonal yods (240 hexagonal yods in each square). 22 corners line the sides of the joined squares, leaving 48 internal corners (24 in each square). Therefore,

$$550 = 480 + 24 + 24 + 22 = 504 + 24 + 22 = 528 + 22.$$

There are 528 yods other than the 22 corners of 1st-order tetractyses that line the sides of the two joined squares. Compare this property with the 550 SLs in CTOL. According to Fig. 36, they comprise 504 SLs down to the top of the 7-tree mapping the physical plane, then 24 SLs in the uppermost four Trees mapping the four etheric subplanes and, finally, 22 SLs in the 3-tree that maps the three dense physical subplanes. The same 22:528 division appears in the two joined squares, which displays the same 24:504 division of the number 528 as that which is found in Nolan's Cross. This is not a coincidence. There are two sets of (240+24=264) yods, just as the 528 yards in the length of the cross comprise its arms of length 240 yards, the vertical length below them of length 240 yards and a section of 48 yards above the arms.

Fig. 37 indicates that the 264 yods in the seven enfolded Type A polygons form three natural sets of 88 yods. This is because they have 47 triangles with 41 corners and 88 sides. There are 47 hexagonal yods at the centres of tetractyses, as well as two hexagonal yods on each side, so that they contain (47+41=88) yods that are either corners or centres of tetractyses and 88 pairs of hexagonal yods, i.e., three distinct sets of 88 yods. In the context of CTOL, there are 176 SLs located on each pillar as far down as the 3-tree. Compare this with Fig. 30, which depicts Nolan's Cross as a three-fold array of three lines 528 ft (176 yards, or 88 fathoms) long. The three sets of 88 yods in the seven enfolded polygons correspond to this, with every yod symbolising a fathom of length. Above the 3-tree are 88 Trees, each with two SLs on each pillar because two triads of SLs are associated with successive Trees. An SL corresponds to a yard, so that a fathom of distance symbolises the two SLs on each pillar in successive Trees. The three sets of 88 yods correspond to the three sets of 88 pairs of SLs extending down to the top of the 3-tree. That is why Nolan's Cross consists of three sections of length 88 fathoms (two yards), each fathom denoting a pair of SLs on each pillar.

This interpretation of the measurements in Nolan's Cross indicates that it maps not all levels of reality but all *higher* realities beyond the material one. The 8:168 division of the Tree of Life parameter 176 marks the transition between the two, for there are eight SLs on each pillar in the four Trees that map the four etheric subplanes, above which there are 168 SLs on each pillar in the 84 Trees mapping the 12 superphysical planes. Fig. 38 displays the *same* division in the inner Tree of Life. The seven enfolded polygons comprise 176 geometrical elements. The two endpoints of the root edge and the straight line joining them are uniquely shared between all the polygons. The top and bottom of the hexagon and its centre are at the same points in the plane of the seven enfolded polygons as the three Sephiroth on the Pillar of Mercy. The two vertical Paths connecting them coincide with the two sides of sectors of the hexagon. Five corners and three sides, i.e., eight geometrical elements, are either shared between the polygons as their common base, playing no part in imparting their *shapes*, or are shared with the outer Tree of Life and therefore not intrinsic to its inner form. We see that (176−8=168) geometrical elements belong exclusively to the inner Tree, shaping its polygons, and eight elements play a non-formative role. This is analogous to the 8:168 division of SLs on each pillar of CTOL created by the four Trees mapping the four etheric subplanes and the 84 Trees mapping the 84 subplanes of the 12 superphysical planes. Dividing the core section of 24 yards into three equal segments of eight yards, each corresponding to the eight SLs on a pillar in the four highest Trees of the 7-tree, completes this analogy. *Nolan's Cross is a numerical map of all levels of reality beyond the physical universe mapped by the 3-tree*. Notice that

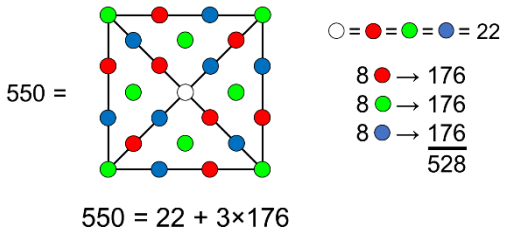
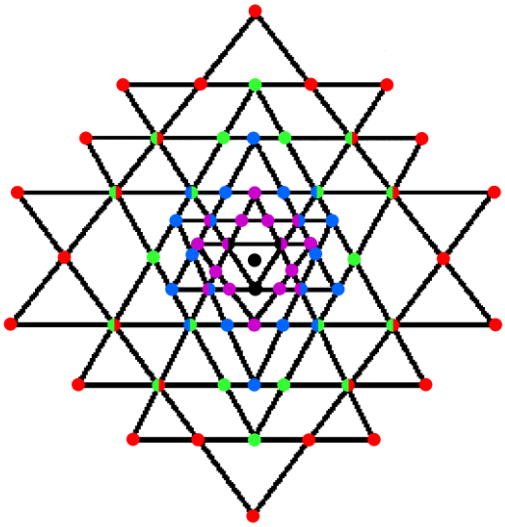


Fig. 39. Square representation of Nolan's Cross as a map of all *higher* levels of reality.

$$550 = 22 + 3\times 176 = 22 + 3\times 8\times 22 = 22 + 24\times 22 = 25\times 22.$$

The number 22 is the number of Paths in the Tree of Life, the number of letters of the Hebrew alphabet and the number of yards in one so-called "chain" (the unit of distance introduced in 1620 for surveying), If we represent the number 550 by a square (Fig. 39) whose 25 yods are assigned the number 22, its central number 22 represents the universe mapped by the 22 SLs up to (but excluding) the top of the 3-tree, and the 24 surrounding number 22s represent the 88 higher Trees of Life with (24×22=528) SLs. The three classes of yods (coloured red, green & blue in Fig. 39) generate the three sets of 176 SLs represented by the three sections of Nolan's Cross of length 176 yards. Nolan's Cross depicts through the length of lines what surrounds the *centre* of this square — all levels of reality beyond the material universe that can be accessed by the evolution of consciousness.

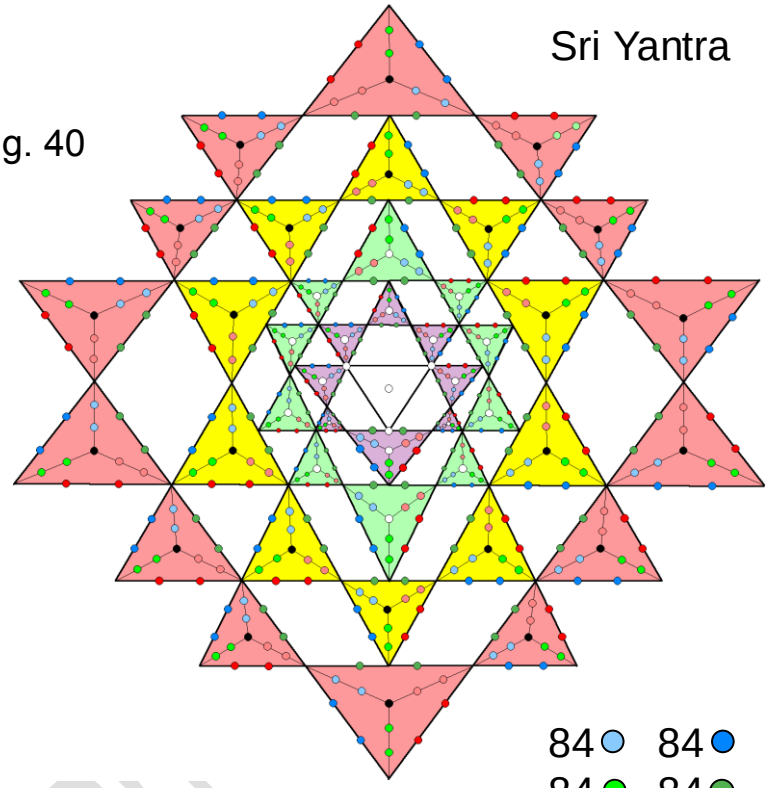
Sri Yantra



87 corners of 43 triangles
and the central bindu point
(Half-circles denote corners above/below another corner)

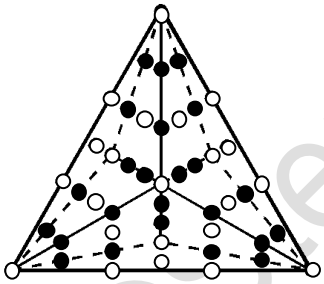
Fig. 40

Sri Yantra



84 ○ 84 ●
84 ● 84 ●
84 ○ 84 ●

Type B triangle



550 = 22 ○ + 24 ● + (3×168=504)

528

24 ● → 24 SLs below top of 7-tree to top of 3-tree
22 ○ → 22 SLs below top of 3-tree

46 → 46 SLs below top of 7-tree

The 46 yods in the Type B triangle symbolise the 46 SLs below the top of the 7-tree mapping the physical plane.

Fig. 41

23. The structural parameter 88 in Nolan's Cross and the Sri Yantra

The number 88 parameterises the inner form of the Tree of Life because the seven enfolded Type A polygons consist of 88 corners & triangles and 88 sides. It also parameterises the 3-dimensional Sri Yantra (Fig. 40). It is composed of the point (bindu) hovering over a central triangle with three corners that is surrounded by the 84 corners of 42 triangles arranged in four layers of eight, ten, ten & 14 linked triangles:

$$1 + 3 + 2(8+10+10+14) = 88.$$

When these triangles are Type A, they have (42×3=126) sectors with (6×42=252) sides, each of which is lined by two hexagonal yods, so that there are 504 such hexagonal yods. They symbolise the 504 SLs in the CTOL down to the top of the 7-tree that maps the seven subplanes of the physical plane. The 252 hexagonal yods (coloured light red, light green & light blue) inside the 42 triangles denote the 252 SLs in the 42 Trees mapping the 42 subplanes of the six cosmic superphysical planes. Pairs of hexagonal yods lying on the same side are coloured the same in order to indicate that they symbolise the pairs of SLs on each pillar associated with each Tree of Life. The 252 hexagonal yods (coloured dark red, dark green & dark blue) on the sides of the 42 triangles denote the 252 SLs in the 42 Trees mapping the 42 subplanes of the six superphysical planes. The 168 hexagonal yods of each primary colour denote the 168 SLs on each pillar of CTOL down to the top of the 7-tree. There are (10+14=24) black yods at the centres of the third and fourth layers of triangles. They correspond to the 24 SLs below the top of the seventh Tree down to the top of the third Tree; they belong to the four highest Trees in the 7-tree that map the four etheric subplanes. There are (1+3+8+10= 22) white yods that comprise the central bindu, the three corners of the central triangle, the centres of the eight triangles in the first layer and the centres of the 10 triangles in the second layer. They correspond to the 22 SLs below the top of the 3-tree that maps the lowest physical subplanes (known in Theosophy as the three "dense physical" subplanes). The 3-dimensional Sri Yantra is a representation of CTOL because it has 504 hexagonal yods lining 126 tetractyses which correspond to the 504 SLs reaching down to the top of the 7-tree, below which are 46 SLs symbolised in the Sri Yantra by (22+24=46) more yods. In other words, formally including the bindu even though it is an isolated point, the Sri Yantra has (504+46=550) yods that lie on all possible sides of the tetractyses from which its triangles can be constructed, given the existence of their 84 corners. There is no arbitrariness about the character of this set of 550 yods, for they are, clearly, all boundary yods that *shape* the tetractyses making up the triangles of the Sri Yantra.

Comparing these equivalent maps with Nolan's Cross, we see that:

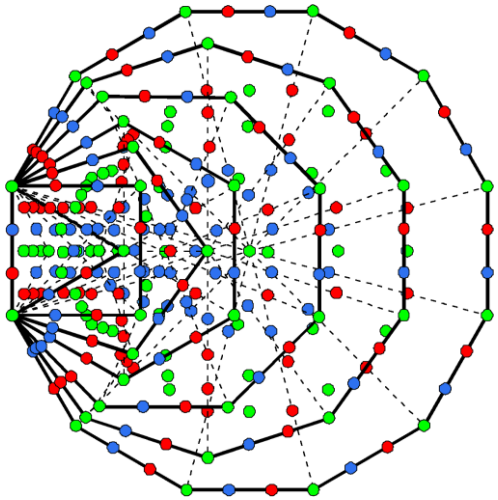
- the 504 hexagonal yods in the Sri Yantra form three sets of 168 correspond to the three segments of length 168 yards;
- the 24 black yods at centres of the triangles in the 3rd & 4th layers correspond to the central core of length 24 yards that is surrounded by these three segments; they correspond to the 24 SLs in the four Trees mapping the four etheric subplanes. The length of the cross is 528 yards because there are (504+24=528) SLs down to the top of the 3-tree mapping the three dense physical subplanes (the visible, physical universe).
- the 22 white yods making up the central triangle and the centres of the 18 triangles in the 1st & 2nd layers correspond to the 22 SLs below the top of the 3-tree mapping the three dense physical subplanes. This has no counterpart in Nolan's Cross because CTOL and the Sri Yantra map *all* levels of reality, whereas Nolan's Cross depicts all levels *beyond* the three-dimensional universe.

The Type B triangle (Fig. 41) displays this 22:24 division of the 46 SLs below the 7-tree because its 46 yods comprise 24 hexagonal yods inside it that line sides of tetractyses and 22 yods that either are corners or centres of tetractyses or hexagonal yods lining the sides of the triangle. In fact, two joined Type B triangles contain 88 yods, and therefore they embody the very number that quantifies the geometrical composition of the inner Tree and the three segments, each 88 fathoms long, that make up Nolan's Cross. The 42:4:42 and 4:84 divisions in their yods created by the four yods in their root edge correspond to:

- the distinction between the four highest Trees of the 7-tree and the (42+42=84) Trees above it;
- the division of each 88 fathom segment into a section of 84 fathoms and a section of four fathoms measured along the vertical length of the cross. Three 84-fathom sections surround a central core of length (3×4=12) fathoms, or 72 ft. This is depicted as the black line segment of Nolan's Cross shown in Fig. 30.

The counterpart of this in the 2nd-order tetractys (Fig. 3) is the fact that its central yod is surrounded by 84 yods. They are symbolising the 84 Trees in CTOL above the 7-tree mapping the physical plane.

Fig. 42



88 ● → 528 ft section
88 ● → 528 ft section
88 ● → 528 ft section

Yod → fathom

The 264 yods in the inner Tree of Life symbolise the 264 fathoms in the length of Nolan's Cross. The three sets of 88 yods correspond to its three sections of 88 fathoms (528 ft).

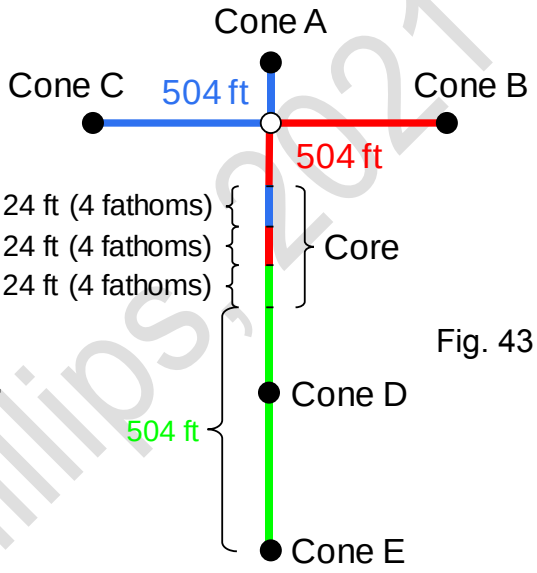
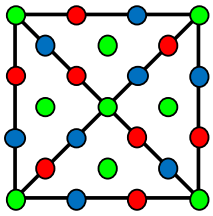


Fig. 43

Nolan's Cross

Fig. 44



Type A square

Boundary of square	**Rest of inner Tree of Life**
4 ●	84 ●
4 ●	84 ●
4 ●	84 ●
12 → 72 ft	252 → 1512 ft

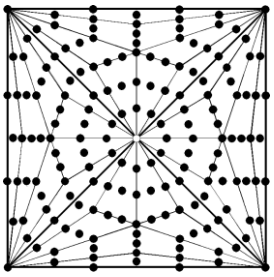
The 12 yods lining the sides of the square as three sets of four yods symbolise the three segments of four fathoms making up the core section 12 fathoms long in the vertical line between the Head Stone and Cone D.

Fig. 45

3	**5**	**7**	**9**
25			**11**
23			**13**
21	**19**	**17**	**15**

Equally spaced along the sides of a square, the first 12 odd integers after 1 add up to 168.

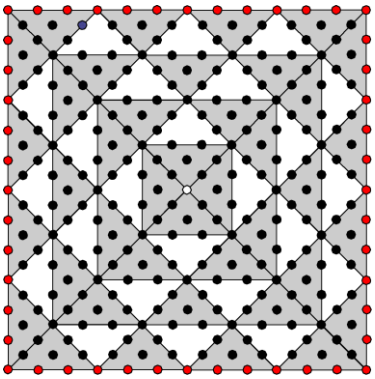
Fig. 46 Type C square



168 ●

The Type C square embodies the number (168) of yards in each section that surrounds the core section of 24 yards.

Fig. 47



48 ●
240 ●

The 48:240 division of yods in a square correspond to the 48 yards between Cone A and the Head Stone and the 240 yards between the latter and Cone E.

24. The square determines the lengths of the core section and the three main sections

The seven enfolded Type A polygons making up the inner Tree of Life have 47 sectors with 41 corners and 88 sides. Two hexagonal yods (coloured red & blue in Fig. 42) lie on each side. Yods at corners of tetractyses and hexagonal yods at their centres are coloured green. There are (41+47=88) green yods, 88 red yods and 88 blue yods, i.e., three sets of 88 yods. In terms of the 91 Trees of Life in CTOL, the 88 blue, green & red yods symbolise the 88 pairs of SLs on, respectively, the Pillar of Mercy, the Pillar of Equilibrium and the Pillar of Judgement as far down as the 3-tree that maps the three-dimensional universe that is part of Einstein's four-dimensional space-time continuum and is what Theosophy calls the three "dense physical subplanes." In the context of Nolan's Cross, the *three* sets of 88 yods express the fact that the cross is divided into *three* parts with equal lengths. Each part is 88 fathoms in length and has a segment four fathoms long that makes up the core of the cross, surrounding which are three sections, each 84 fathoms (168 yards) long (Fig. 43). We pointed out on page 44 that these three sets of four fathoms, or eight yards, are the counterpart of the eight SLs on each pillar of the four highest Trees in the 7-tree that map what Theosophy calls the four "etheric subplanes." The question arises: what 12 yods in the 264 yods of the seven enfolded polygons measure the core length of 24 yards that are analogous to the 24 SLs in these four Trees? They must comprise four corners and eight hexagonal yods that line four sides of tetractyses. All the 12 yods must lie on the *boundary* of the seven enfolded polygons, not inside them or of both types, because they symbolise the length (12 fathoms) of the core, which is part of the vertical distance of 120 fathoms below the arms of the cross; this is the section that corresponds to the 120 yods lining sides of polygons. The only polygon that has four corners and four sides is the square. Therefore, only the 12 yods lining its sides satisfy this condition (Fig. 44). They are of three types and each set of four yods symbolises a segment of four fathoms making up the core of the cross in the line between the Head Stone and Cone D.

The square determines not only the core of Nolan's Cross but also the length (168 yards)of each of its three sections, as symbolised by the remaining 84 yods of each type in the seven enfolded polygons. As

$$13^2 - 1 = 168 = 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21 + 23 + 25,$$

168 is the sum of the first 12 odd integers after 1 that can be arranged along the sides of a square, four to a side (Fig. 45). Notice that the sum of the odd integers at its corners is 48. Notice also that

$$11^2 - 1 = 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21 = 120$$

is the sum of the first 10 odd integers after 1 and that

$$23 + 25 = 48,$$

is the sum of the next two odd integers. This 48:120 division of the number 168 manifests in one of the three sections as the distance of 48 yards between Cone A and the Head Stone and the distance of 120 yards between the latter and either Cone B or Cone C. The number of yods surrounding the centre of the nth-order m-gon is $3m(1 + 3^n)/2$ (for proof, see page 5 in Article 65 at the author's website). For the Type C square (m = 4, n = 3), this is 168 (Fig. 46). The number of yods surrounding the centre of the n-gon with 2nd-order tetractyses as its sectors is 72n (p. 4). The square (n = 4) has 288 such yods (Fig. 47). This is the distance in yards between Cone A and Cone E. The perimeter of the square is lined by 48 yods, leaving 240 yods. This corresponds to the distance of 48 yards between Cone A and the Head Stone and to the distance of 240 yards between the latter and Cone E. As the geometrical symbol of the Pythagorean Tetrad, the square embodies not only various parameters of Nolan's Cross but also other numbers of cosmic significance. Some are of relevance to superstring theory and have been analysed at the author's website. Earlier (see pp. 19-26), we discussed in the context of E_8 and $E_8 \times E_8'$ the meaning of the number 240 and its double appearance in Nolan's cross. This is but one example among many.

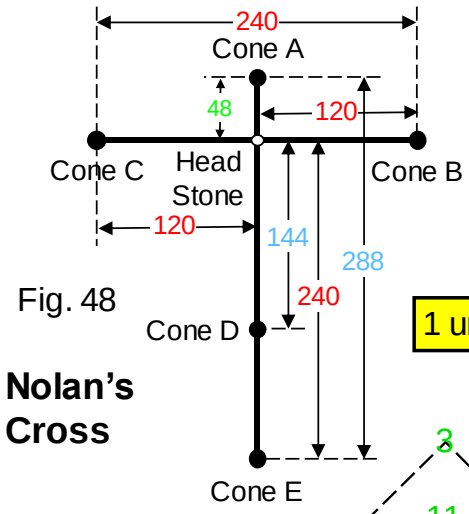
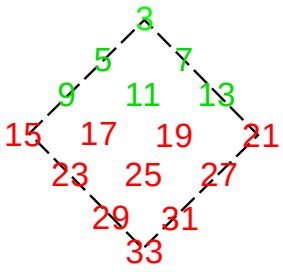


Fig. 48

Nolan's Cross

1 unit = 1 yard



288 = 15 17 19 21 = 48 + 240

Fig. 49

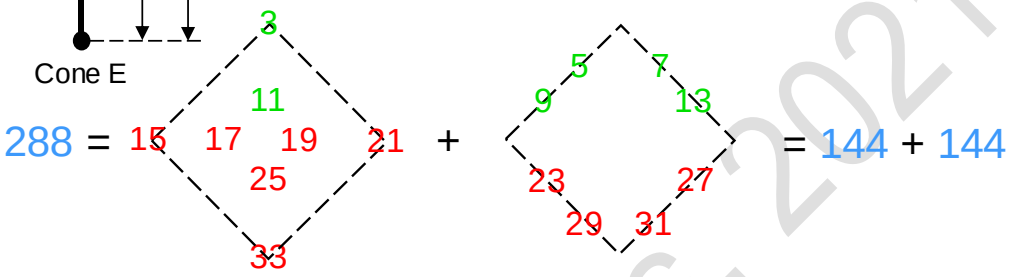


Fig. 50

Sum of 8 diagonal numbers = 144
Sum of 8 boundary numbers = 144

1 + 2 + 3 + … + 32 = 528
= (1+32) + (2+31) +… + (16+17)
= [(1+32) +… + (8+25)] + [(9+24) +… + (16+17)]
= 8×33 + 8×33 = 16×33 = 264 + 264.

The 32 Paths of Wisdom

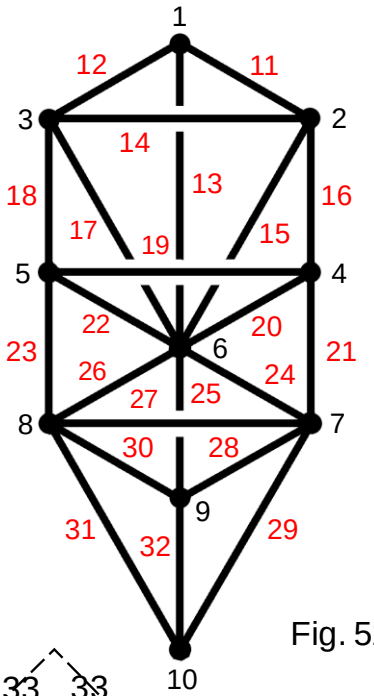


Fig. 51

The separate halves of the inner Tree of Life

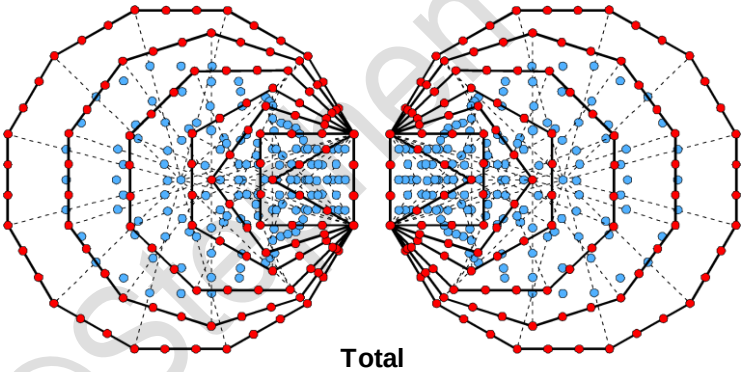


Fig. 52

120	Total	120
144	288	144
264	528	264

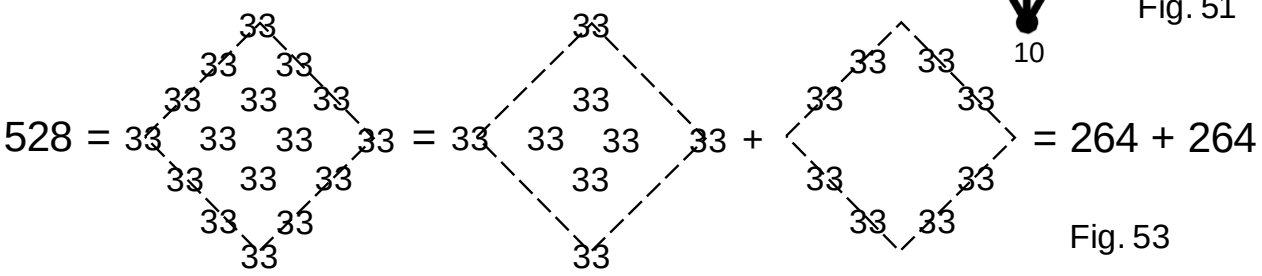


Fig. 53

25. The number 528 as the 32nd triangular number

As

$$17^2 - 1 = 288 = 3 + 5 + 7 + \ldots + 33$$

is the sum of the first 16 odd integers after 1, the length in yards of the vertical arm of Nolan's Cross (Fig. 48) is 288, where 288 is the sum of a 4×4 array of the odd integers 3-33 (Fig. 49). As

$$7^2 - 1 = 48 = 3 + 5 + 7 + 9 + 11 + 13$$

is the distance in yards between Cone A and the Head Stone, the triangular array of the first six odd integers (coloured green) generates this distance, whilst the tetractys array of the 10 remaining odd integers (coloured red) generates the distance of 240 yards between the Head Stone and Cone E. Alternatively, the sum of the eight diagonal odd integers is 144, which is the distance between Cone D and the Headstone, and the sum of the eight odd integers on the sides of the square is also 144, which is the sum of the distances between Cone A and the Head Stone and between Cones D and E (Fig. 50).

The *Sepher Yetzirah* (Book of Formation), traditionally ascribed to Abraham, opens with the words "The 32 mystical Paths of Wisdom" by means of which God created the universe. The 32 Paths of Wisdom are interpreted as the ten Sephiroth and the 22 Paths of the Tree of Life, to which the 22 letters of the Hebrew alphabet are assigned. There are three horizontal Paths, corresponding to the three mother letters; seven vertical Paths, corresponding to the seven doubled letters; and twelve diagonal Paths, corresponding to the twelve elemental letters. The first ten integers are assigned to the ten Sephiroth in the order of their emanation. The integers 11-32 are assigned to the 22 Paths (Fig. 51).

Physicists know that the number of space-time components of the Dirac wave function for a D-dimensional fermion is $2^{D/2}$. When D = 10, this is $2^5 = 32$. The number 32 is therefore predicted by superstring theory to be the number of space-time components of the Dirac wave function of a 10-dimensional fermion. The superstring significance of the numbers 10, 22 & 32 is that heterotic superstrings exist in 10-dimensional space-time with modes of vibration that extend into 22 higher, compactified dimensions. Their fermionic states are described by Dirac wave functions with 32 components.

In view of the central role played by the number 32 in the mathematics of the universe, according to the *Sepher Yetzirah*, it should not be a mystery why the number 528 is the total distance in yards between the various stone markers of Nolan's Cross, which embodies some of the parameters of holistic systems. It is the sum of the first 32 integers:

$$1 + 2 + 3 + \ldots + 32 = 528.$$

In other words, it is the 32nd *triangular number*. Adding together the first and last integers, the second and penultimate integers, etc generates 16 equal numbers 33: 528 = 16×33. In terms of the Pythagorean integers 1, 2, 3 & 4 symbolised by the four rows of the tetractys,16 = 4^2 and 33 = 1! + 2! + 3! + 4!, i.e., it is the sum of all the numbers of permutations within each row of 10 objects arranged as a tetractys. The first eight 33's add up to 264, as do the last eight 33's. This divides the number 528 into two equal number 264, each of which is the sum of 16 integers. The inner Tree of Life consists of two sets of seven enfolded regular polygons joined at their "root edge." Regarded separately, both sets contain 528 yods, each set containing 264 yods (Fig. 52). One set is the counterpart of the first 16 integers; the second set is the counterpart of the last 16 integers. Alternatively, the sum of the eight 33's in the two diagonals is 264, as is the sum of the eight 33's on the sides of a 4×4 square array of 33's (Fig. 53). As

$$23^2 - 1 = 528 = 3 + 5 + 7 + \ldots + 45$$

is the sum of the first 22 odd integers after 1 and

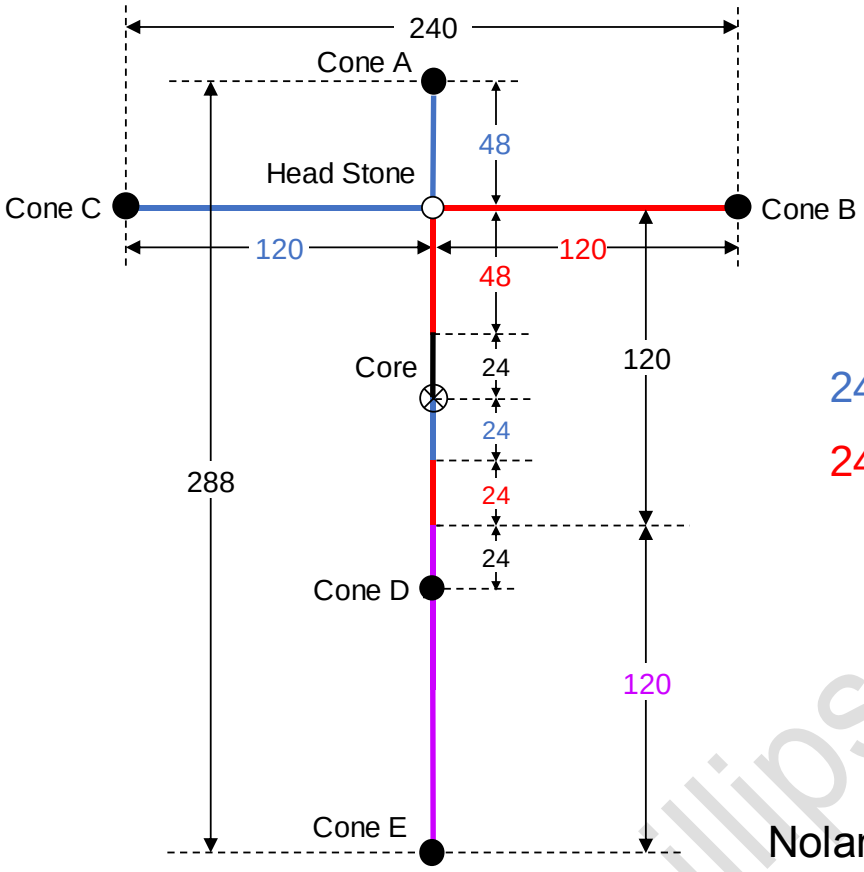
$$17^2 - 1 = 288 = 3 + 5 + 7 + \ldots + 33,$$

is the sum of the first 16 odd integers after 1,

$$528 - 288 = 240 = 35 + 37 + 39 + \ldots + 45.$$

is the sum of the last six odd integers. This 6:16 division of the first 22 odd integers after 1 has its dimensional counterpart in superstring theory as the six compactified dimensions of 10-dimensional space-time and the 16 higher dimensions of 26-dimensional space-time. It corresponds in the inner Tree of Life to the 240 yods lining the sides of the 14 polygons and as the 288 yods that are inside them (Fig. 52). There are 240 yards in the horizontal arm of Nolan's Cross and 288 yards in its vertical section.

The number of feet in one mile is 5280, which is 528×10. The English statute mile was established by a Weights and Measures Act of Parliament in 1593 during the reign of Queen Elizabeth I. The factor of 10 arises from the fact that there are ten chains, each of 22 yards, in each of eight furlongs. The number 33 measures a distance of half a chain.



1 unit = yard

168

24 + 120 + 48 = 192

24 + 120 + 48 = 192

168

192 + 192 = 384

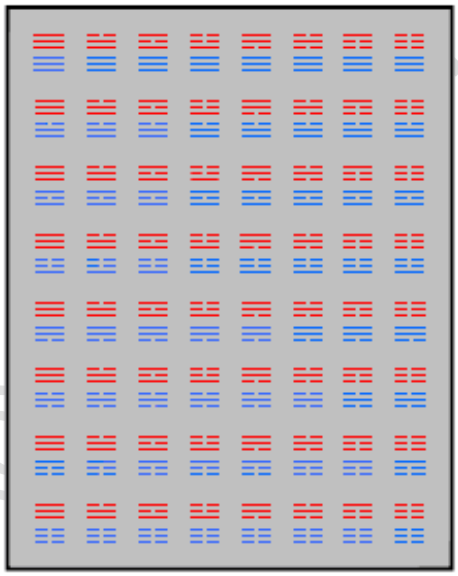
120 + 384 = 504

24 + 504 = 528

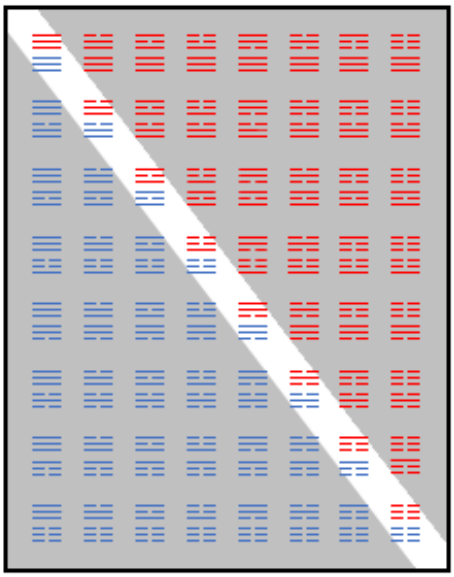
Nolan's Cross

Fig. 54

64 hexagrams



64 hexagrams



8×(12— + 12--) = 96— + 96--

8×(12— + 12--) = 96— + 96--

Total = 192— + 192--

	off-diagonal	diagonal		off-diagonal
	84—	12—	12—	84—
	84--	12--	12--	84--
Total =	168	24	24	168
		192	192	

26. Nolan's Cross as a representation of the 64 hexagrams

The ancient Chinese system of divination is based upon creating three random events where there are two possible outcomes, such as tossing a coin, then repeating the series and consulting commentaries for the obtained results in an ancient Chinese book called the "I Ching " (Books of Changes). The pair of outcomes for each event are symbolised by an unbroken line, denoting yang, and a broken line, expressing yin, where yang and yin are the polar opposite, but complementary, aspects of all cosmic processes, traditionally called "male" and "female" but having a metaphysical, rather than a biological, connotation. Three successive, binary events can take (2^3=8) forms, each symbolised by columns of three parallel lines and broken lines called "trigrams." The eight types of trigrams contain 12 lines & 12 broken lines and they can be paired in (8×8=64) ways. Each pairing is called a "hexagram." If we consider eight identical rows of eight trigrams and superimpose on it eight identical columns of the eight trigrams, we generate 64 pairs of trigrams (Fig. 54). They comprise (64×6=384) lines & broken lines, where

$$384 = 2^2 + 3^2 + 4^2 + 5^2 + 6^2 + 7^2 + 8^2 + 9^2 + 10^2.$$

There are 192 lines and 192 broken lines. The diagonal set of eight hexagrams in the 8×8 array of hexagrams consists of two identical sets of eight trigrams, i.e., 24 lines and 24 broken lines (48 lines & broken lines). The 56 off-diagonal hexagrams have (384−48=336) lines & broken lines (168 lines & broken lines in each diagonal half. It is simple to show that each half has 84 lines and 84 broken lines. The upper trigrams in the diagonal hexagrams with 24 lines & broken lines are associated with the 168 lines & broken lines in the 28 upper, off-diagonal hexagrams. Similarly, the lower trigrams in the diagonal hexagrams are associated with the 168 lines & broken lines in the 28 lower, off-diagonal hexagrams. Hence,

$$384 = 192 + 192,$$

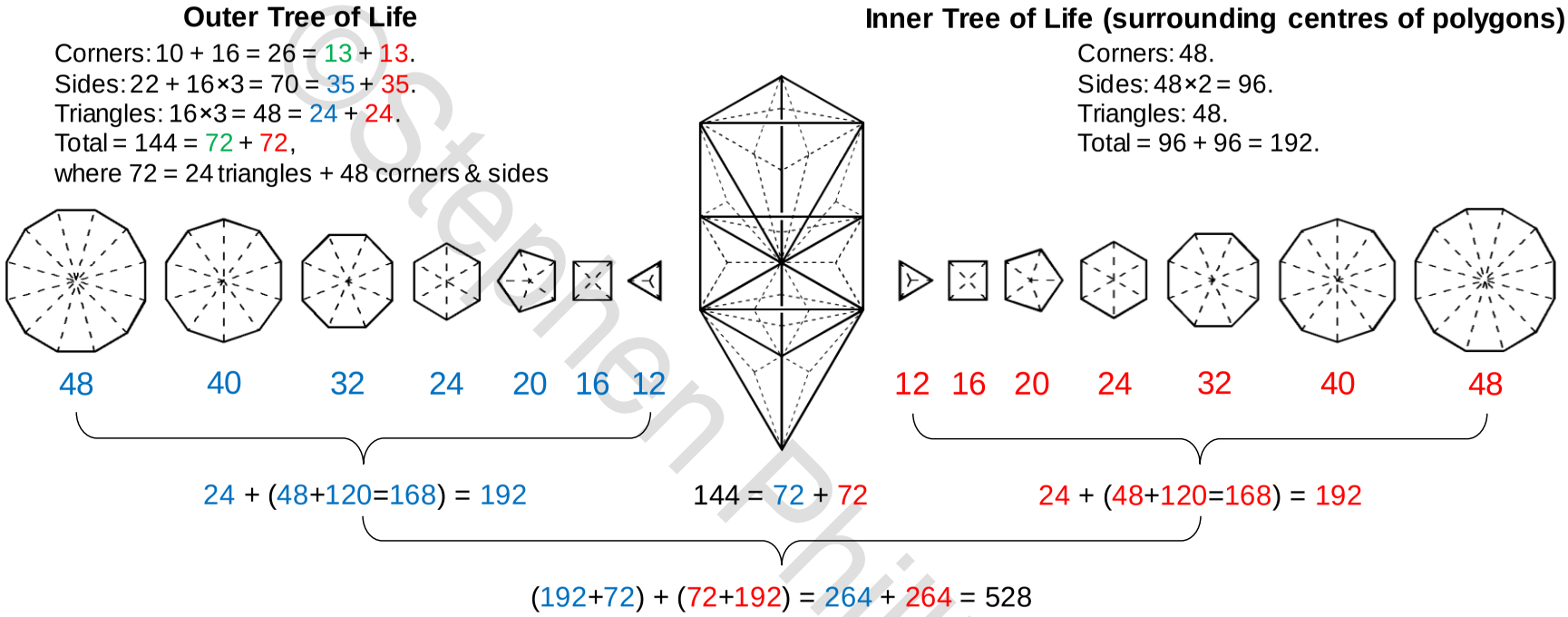
where 192 = 24 + 168 = 24 + 7×24 = 8×24, so that 384 = 16×24 = 4^2×4!. This demonstrates how the Tetrad (4) expresses the 384 lines & broken lines making up the 64 (=4^3) hexagrams. Notice that each diagonal half of the array contains the *same* number of yang and yin lines (96 of each type).

Measured in yards, the total length of Nolan's Cross is 528; this is 22×24. The core section of 24 yards is surrounded by 21 basic segments of 24 yards (ten in its horizontal arms, 11 in its vertical line). Each red or blue L-shaped section is 168 yards long (seven basic segments) and is divided into sections of 120 yards and 48 yards. So, too, is the third section 168 yards long, measured on the vertical line from Cone E and ending at the point ⊗ that is midway between the Head Stone and Cone D. Below this point are two basic segments of 24 yards, the rest of the line being 120 yards long. They correspond to the two sets of 24 lines & broken lines making up the 16 trigrams in the eight diagonal hexagrams. *A basic segment of 24 yards is the counterpart of a complete set of eight trigrams with 24 lines & broken lines, a yard length corresponding to either a line or broken line*. The two sections of 168 yards as two sets of seven basic segments are the counterparts of the seven sets of eight trigrams (168 lines & broken lines) in each off-diagonal half of the 8×8 array of hexagrams.

It may be asked: why not choose either arm of the cross with length 120 yards so that the rest of it has the required length of 384 yards? If it were merely a matter of arithmetic, the question would have a point. What section of the cross corresponds to the number 120 seems to be ambiguous because several choices are available: Suppose, however, that the mirror symmetry of the cross with its vertical axis as the mirror expresses the balance of polarity between the 192 yang (unbroken) lines and the 192 yin (broken) lines. With the diagonal of the array of 64 hexagrams acting as the mirror, there are 96 yang lines and 96 yin lines in each diagonal half, according to Fig. 54. Then every yard that corresponds to a yang line should have a mirror image that corresponded to a yin line, and vice versa. Removing one arm of the cross destroys this mirror symmetry. Therefore, the 384 yards must include *both* arms:

$$384 = 120 + 120 + 144,$$

so that neither arm can be a possible choice for the number 120. Any yard distance measured along the vertical axis will have its mirror image counterpart on the *same* line, for one can always sort 144 yards measured on this line into two groups of 72 and regard each member of one group in a purely formal sense as the mirror image of its counterpart in the other group. If we want the isomorphism between the partial cross and the 64 hexagrams to reflect the balance of yang/yin polarity of its lines and broke lines, there is no alternative but to remove 120 yards from the vertical line in a way that leaves unaltered the two L-shaped sections of length 168 yards, as well as the core of length 24 yards, all of which have been discussed in previous sections. There is only one way to achieve this, and it is the one discussed above.



Total number of geometrical elements

528 = 144 + 192 + 192 = 72 + 72 + 384
= (24+48) + (24+48) + 384
= (48+48) + 24 + 24 + 384
= (96+24) + 24 + 384 or (96+24) + 24 + 384
= 120 + 24 + 384 or 120 + 24 + 384
= 24 + 504 or 24 + 504,
where 504 = 120 + 384 = 120 + (24+168) + (24+168)
= (120+24+24) + 168 + 168 = 168 + 168 + 168.

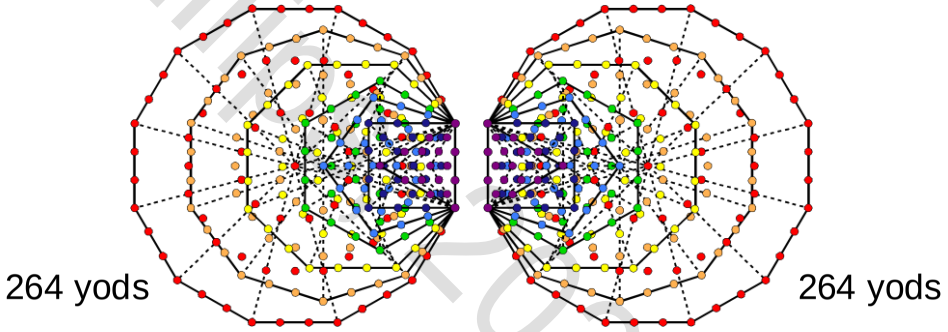


Fig. 55. The 528 yards of Nolan's Cross correspond to the 528 geometrical elements in the outer & inner Trees of Life

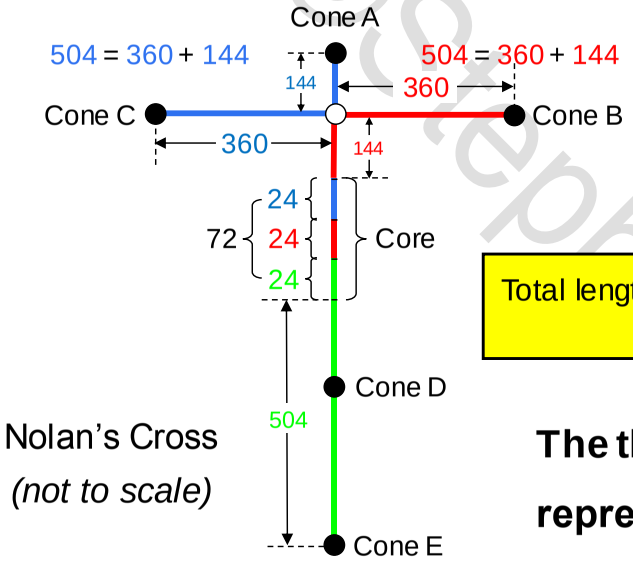
27. Outer & inner Tree of Life counterpart of Nolan's Cross

A Type A polygon has per sector one corner, an external side, an internal side and one triangle, i.e., four geometrical elements. The seven regular polygons of each half of the inner Tree of Life have 48 sectors. Surrounding their centres are (48×4=192) geometrical elements (96 corners & triangles and 96 sides). Both halves have (192+192=384) geometrical elements (192 corners & triangles and 192 sides). The hexagon in each half has 24 geometrical elements (12 corners & triangles and 12 sides) surrounding their centres. This means that the six other polygons in each half have (192−24=168) geometrical elements (84 corners & triangles and 84 sides). Compare these properties with the 64 hexagrams discussed in the previous section; they contain 384 lines and broken lines (192 lines and 192 broken lines). Each of the two sets of eight trigrams in the diagonal of the 8×8 array are similar and contain 12 lines and 12 broken lines. The 28 hexagrams in each off-diagonal half of the array contain 168 line & broken lines (84 lines & 84 broken lines). Each geometrical element corresponds to either a line or a broken line, the two similar hexagons are the counterpart of the two similar sets of trigrams in the diagonal, and the six other polygons in each half are the counterparts of the 168 lines & broken lines in each off-diagonal half of the array, the two halves of the inner Tree of Life corresponding to its two complete, diagonal halves. The inner Tree of Life made up of (192+192=384) geometrical elements is isomorphous to the (192+192=384) lines & broken lines. Why? Because they *must* be, being representations of the universal pattern underlying holistic systems. It is why this pattern appears in Nolan's Cross. It is really an archetypal pattern of numbers expressed in distances between marker stones. These numbers are sacred because they parameterise the mathematical nature of all levels of reality, including space-time. The pattern of this Whole re-appears in anything that is a manifestation of that Whole.

The outer Tree of Life consists of 16 triangles with 10 corners and 22 sides, i.e., 48 geometrical elements. When they are Type A, there are one corner, three sides & three triangles inside each one, the corner replacing the original triangle, so that (16×6=96) new geometrical elements are added, making a total of (48+96=144) geometrical elements. Because of the axial symmetry of the outer Tree of Life, every element in its left side has a counterpart in its right side that is its mirror image. However, some corners are aligned with this axis, whilst some sides and triangles extend across both halves. As 144 is an even integer, the number of such elements that do not have a mirror image must also be even. This allows them to be put in equal numbers into two groups that can formally be associated with those in either half that do have mirror images (the details of this can be found at the author's website). What is pertinent here is not so much the concept of 'mirror image' but how the outer Tree can be regarded as having two mathematical halves that need not be literal mirror images of each other. Fig. 55 shows that each half (properly defined) has 72 geometrical elements composed of 24 triangles and 48 corners & sides. The total number of geometrical elements in the separate outer & inner Trees of Life (apart from polygonal centres) = 144 + 384 = 528. This is the length in yards of Nolan's Cross! Suppose that we colour red/blue all numbers referring to geometrical elements on the right/left side of the outer Tree or the right/left half of its inner form. Then (referring to Fig. 55) there are (192+72=264) geometrical elements associated with each half of the outer & inner Trees (note that we are considering the outer and inner forms as *separate*, not combined). They are symbolised in the seven enfolded polygons of the inner Tree of Life as its 264 yods. As 264 = 11×24, there is only one section in the cross that is both 264 yards long (11 basic units of 24 yards) and a *continuous* path marked solely by stones and that is Cone B-Head Stone-Cone D (see Fig. 5). The remaining section that is 264 yards long:

Cone A-Head Stone-Cone C and Cone D-Cone E

consists of two *disjoint* paths. The calculation shown in Fig. 55 shows that the Tree of Life counterpart of the core section of 24 yards that is surrounded by three sections of 168 yards is the 24 triangles in each half of its outer form when it is composed of 16 Type A triangles, that is, the 24 sectors of the eight triangles making up each half. Because of the left/right symmetry in the outer & inner Trees, we cannot pin down further which set of 24 triangles corresponds to the core section of 24 yards. Perhaps the ambiguity is a false one, because we are comparing what is being regarded as a binary, one-dimensional system with only left/right symmetry and without a centre or core in a spatial sense with a three-fold representation of the 2-dimensional Nolan's Cross as three segments of length 168 yards with a segment of 24 yards at its centre, which we have previously called its "core." However, its factorisation 24 = 8×3 has a geometrical origin, and this is consistent with Fig. 43, which indicates that the core is three segments of eight yards (4 fathoms). It is also consistent with Fig. 35, which indicates that its counterpart in CTOL is the eight SLs on each of the three Pillars in the uppermost four Trees of the 7-tree that maps the physical plane. They map the four etheric subplanes that act as an interface between the physical universe perceived by the five senses and all higher, non-physical levels of reality.



Nolan's Cross

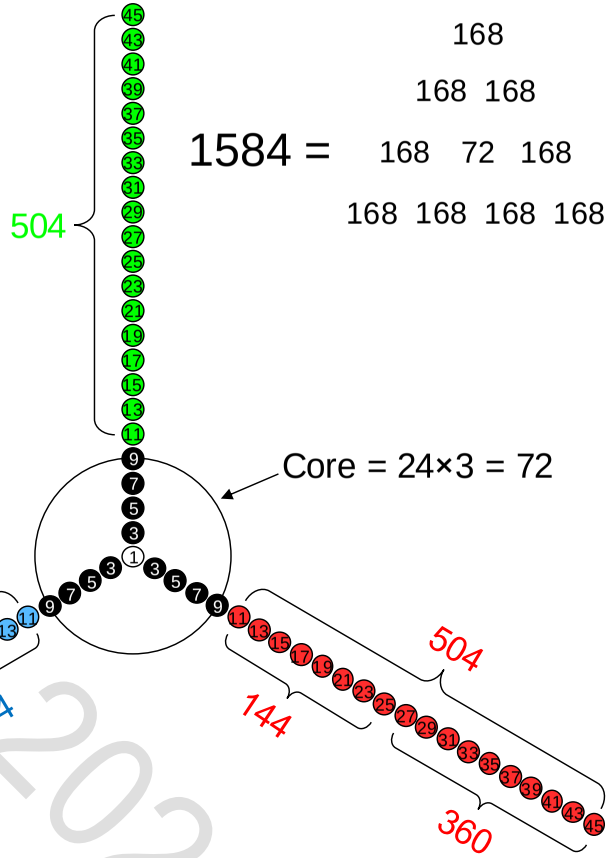
(not to scale)

Figure 56

1 unit = 1 ft

Total length = 504 +24 + 504 + 24 + 504 + 24
= 3×528 = 1584.

The three-fold, arithmetic representation of Nolan's Cross



1584 =

168

168 168

168 72 168

168 168 168 168

$528 = 23^2 - 1 = 3 + 5 + ... + 45.$

$5^2 - 1 = 24 = 3 + 5 + 7 + 9.$

$528 - 24 = 504 = 11 + 13 + ... + 45.$

$11 + 13 + ... + 25 = 144 \rightarrow$ Cone A-Head Stone distance.

$27 + 29 + ... + 45 = 360 \rightarrow$ Cone B/C-Head Stone distance.

$72 = 3 \times 24 = 9 + 15 + 21 + 27.$

$1584 = 3 \times 528 = 72 + 33 + 39 + ... + 135$

$= 72 + (33+135) + (39+129) + ... + (81+87)$

$= 72 + 168.+ 168 + ... + 168 = 72 + 9 \times 168$

$= 72 + 72 \times 21 = 72 \times 22.$

28. The three-fold arithmetic representation of Nolan's Cross

What has been called the "core" of Nolan's Cross is a segment 72 ft long that starts 144 ft below the Head Stone (Fig. 56) . Its middle point is (144+36=180) ft below it and 540 ft above Cone E. But that is only its spatial centre. It has a deeper, conceptual meaning in terms of Nolan's Cross as a representation of the universal pattern governing holistic systems. As Section 21 revealed, the three segments of eight yards correspond to the three columns of eight SLs in the four Trees that map the four etheric subplanes of the physical plane. Their halfway point is Kether of the fifth Tree, which is Malkuth of the seventh Tree mapping the first etheric subplane. This SL signifies the appearance of the most basic form of etheric matter — the superstring of shadow matter whose unified force has the symmetry of the second factor E_8' in $E_8 \times E_8'$ heterotic superstrings. We saw in Section 10 that the 240 yards in each arm of Nolan's Cross correspond to the 240 roots of E_8 and the 240 roots of E_8'. Each segment of eight yards corresponds to the eight SLs on each pillar of CTOL, and it important to realise that moving down along this 24-yard line through the segments does not correspond to moving down through the 7-tree *as a whole*; it amounts only to descending a single Pillar — the one that corresponds to that segment, for the three complete segments of 176 yards correspond to the 176 SLs in CTOL down to the top of the 3-tree. This marks the transition from the visible universe to all invisible domains of the higher planes of consciousness. Therefore, the physical middle of the three segments has no meaning vis-à-vis their *metaphysical* meaning; each segment refers to a different Pillar, just as the three primary segments of 168 yards (504 ft) do.

As

$$23^2 - 1 = 528 = 3 + 5 + \ldots + 45$$

and

$$5^2 - 1 = 24 = 3 + 5 + 7 + 9,$$

$$528 - 24 = 23^2 - 5^2 = 504 = 11 + 13 + \ldots + 45.$$

The first eight of these odd integers add up to 144, which is the distance in feet between Cone A and the Head Stone. The last 10 of the odd integers add up to 360, which is the distance in feet between the Head Stone and either Cone B or Cone C. A three-fold array of the first 22 odd integers after 1 generates the total length (1584 ft) of Nolan's Cross. The first four odd integers after 1 in each arm of the array: 3, 5, 7 & 9 generate the 24 yard-long core and the last 18 odd integers in each arm generate the 504 yards in the three primary sections. The complete length of 1584 ft consists of the core of 72 ft and a length of 1512 ft. As shown in Fig. 56, the 18 odd integers that add up to 1512:

$$1512 = 33 + 39 + \ldots + 135,$$

pair up as nine equal numbers 168:

33 + 135 = 168	39 + 129 = 168	45 + 123 = 168
51 + 117 = 168	57 + 111 = 168	63 + 105 = 168
69 + 99 = 168	75 + 93 = 168	81 + 87 = 168

It means that the *complete* length of Nolan's Cross can be represented as a tetractys array of nine 168s with the number 72 at its *centre*:

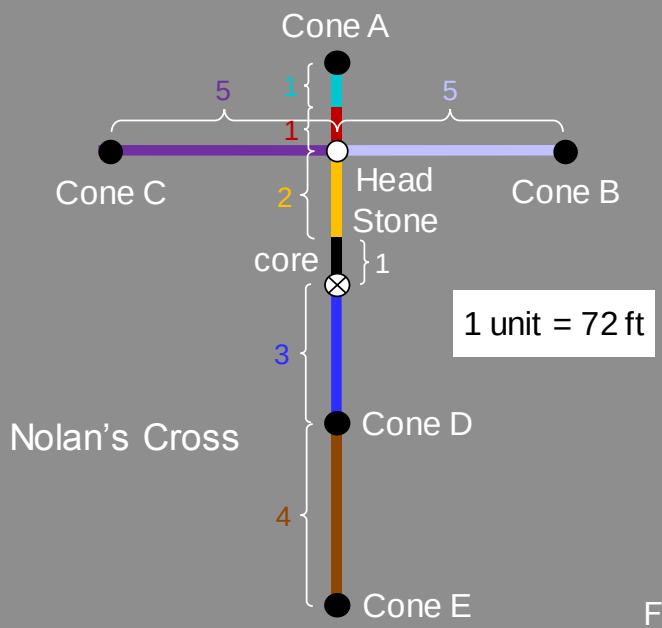
$$1584 = 72 + 9 \times 168.$$

This *natural*, arithmetic property of the three sets of 22 odd integers confirms the pivotal role played by the core segment that is 72 ft long. It is the rich source of all the patterns of numbers that provide its meanings, which are not disconnected but merely re-arranged aspects of one unbroken, mathematical whole. Like the nine Sephiroth that emanate from Kether at the top of the Tree of Life, the cross can be regarded as like a tree that grows out of its seed, spreading away from its 24-yard segment along three distinct paths that are 168 yards long and creating nine segments (three per path), each of which is 168 ft long. The core has a three-fold character represented by three eight-yard segments; each one gets multiplied 21 times to create its associated path of length 168 yards, so that

$$8 + 21 \times 8 = 176$$

and the total length of Nolan's Cross = 3×176 = 528 yards. This 8×3 factorisation of the core segment has its parallel in the basic set of eight trigrams that forms eight rows and eight columns, the intersections of which are pairs of trigrams — the 64 hexagrams (see Section 25).

Students of Kabbalah will recognise that 21 is the gematria number value of Ehyeh (אהיה, "I am"), the Divine Name assigned to Kether, the first Sephirah. Through the dodecagon, it expresses the total length of Nolan's Cross (see the first paragraph on page 71).



Nolan's Cross

Fig. 57

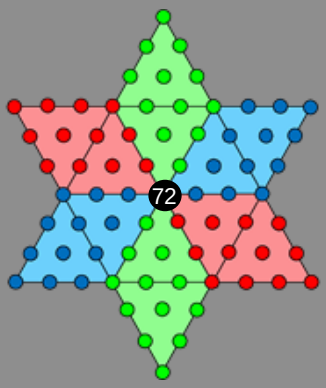
10=1+2+3+4

5 5 1

אהיה = 21

The letter values of Ehyeh measure lengths of segments of Nolan's Cross in units of 72 feet.

1584 =



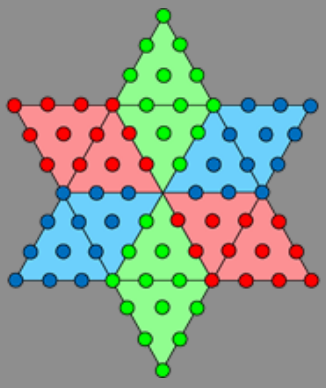
● = ● = ● = 21 ft

24×21 = 504
24×21 = 504
24×21 = 504
1512

Fig. 58

The hexagram composed of tetractyses represents the three major sections of Nolan's Cross, as well as generating the core length of 72 ft.

72 =



● = ● = ● = 1 ft

72 = 24 + 24 + 24

24 = 8×3 ●
24 = 8×3 ●
24 = 8×3 ●

In feet, 1584 = 72×22 = 72 + 72×21 = 72 + (24+24+24)×21
= 72 + 504 + 504 + 504.
In yards, 528 = 24 + 168 + 168 + 168.

29. The Divine Name Ehyeh & the hexagram generate Nolan's Cross

The total length of the vertical and horizontal lines of Nolan's Cross is 1584 ft. This number is 72×22.The core segment (shown as the black line in Fig. 57) has a length of 72 ft and is surrounded by three primary sections of 504 ft because 72×21 = 72×7×3 = 504×3. As the largest factor of any number expressing horizontal or vertical distances between stone markers, the number 72 turns these distances into n units of 72 ft, where 1≤n≤12. As there are 72n yods surrounding the centre of a polygon with n corners when its sectors are 2nd-order tetractyses, a line n units long is equivalent to a polygon with n corners. This equivalency is valid only for n≥3, which means that there is no polygonal counterpart for the distance of 144 ft (n = 2) between Cone A and the Head Stone. This segment must be regarded as two segments, each one unit in length. They are coloured turquoise and violet in Fig. 57. The segments surrounding the core have lengths 1, 1, 5, 5, 2, 3 & 4. Below the turquoise one are segments of length 1 (violet), 2 (yellow), 3 (blue) & 4 (brown), where 1 + 2 + 3 + 4 = 10. The numbers 1, 5, 5, & 10 are the gematria number values of the Hebrew letters making up the word Ehyeh (אהיה, "I am"), the Godname assigned to Kether, which is the first Sephirah of the Tree of Life. Its number value 21 is the number of repetitions of the unit length of 72 ft in the core segment that are needed to construct all the lines making up Nolan's Cross.

Constructed from tetractyses, a hexagram has 72 yods surrounding its centre (Fig. 58). When each yod symbolises the length of one foot, this ancient, religious symbol expresses the core distance of 72 ft and the unit of distance that reveals distances in Nolan's Cross to be integers no larger than 12. Its six points consist of three pairs 120° apart, each pair consisting of 24 yods (either red, green or blue) that are arranged as eight sets of three. This is the geometrical basis for the core being regarded, as established in previous sections, as three equal segments of eight yards, each being associated with a segment of 168 yards that is exactly 21 times longer. What is revealed is a whole whose parts are measured to reproduce the pattern of the geometry of the hexagram, according to which the core segment is measured and divided into three equal parts of eight yards. Nolan's Cross. The author has shown that the archetypal number 21 determines in various mathematical ways the structural parameters of the Tree of Life and its isomorphic counterpart in other sacred geometries. Nolan's Cross illustrates its prescriptive power, for the length of its horizontal arms is 240 yards, where 240 is the sum of the first 21 binary coefficients other than 1:

$$240 = \binom{2}{1} + \binom{3}{1} + \binom{3}{2} + \binom{4}{1} + \binom{4}{2} + \binom{4}{3} + \binom{5}{1} + \binom{5}{2} + \binom{5}{3} + \binom{5}{4} + \binom{6}{1} + \binom{6}{2} + \binom{6}{3} + \binom{6}{4} + \binom{6}{5} + \binom{7}{1} + \binom{7}{2} + \binom{7}{3} + \binom{7}{4} + \binom{7}{5} + \binom{7}{6}$$

The three primary sections of 168 yards are an expansion by a factor of 21 of the triple eight-yard segments constituting the core. Including its centre, the hexagram contains 73 yods, where 73 is the gematria number value of Chokmah, which is the second Sephirah. 73 is the 21st prime number:

2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73

For the ancient Pythagoreans, the number 1 was not a number but the Monad, the principle and source of all numbers, which were merely its repetition. For them, the number 22 would have been the 21st integer. But the designers of the cross were not being just good Pythagoreans in measuring out distances that repeated the core length 21 times. They were also Kabbalists who knew that the Tree of Life is composed of 22 straight lines. Their genius was in choosing a unit of length of 72 ft to measure out, effectively, 22 straight lines to create the shape of a cross. This made its proportions conform to the archetypal geometry of the outer and inner forms of the Tree of Life. They no doubt knew that the 22 letters of the Hebrew alphabet consist of the Three Mother Letters: Alef, Mem and Shin, the Seven Double Letters: Bet, Gimel, Dalet, Kaf, Pe, Resh, and Tav, and the Twelve Simple Letters: He, Vav, Zayin, Het, Tet, Yod, Lamed, Nun, Samekh, Ayin, Tsadik and Qof. Even though they would have known that the 22 Hebrew letters can therefore be divided into classes of 10 and 12, they still needed to choose a unit of length of 24 yards to create horizontal and vertical arms of respective lengths (24×10=240) yards and (24×12=288) yards. Was this unit chosen simply because the number 72 is known to Kabbalists as the number of Names of God? No, because this fails to account for the presence and location of Cone D, for why would they add a fifth stone if they were merely intent on creating a cross that was scaled according to only two well-known, Kabbalistic considerations? Why divide the vertical arm in the ratio 2:10 required to create the 48:240 yards division that matches the 48 corners and 240 hexagonal yods in the seven polygons of the inner Tree? This cannot be just coincidence! The cross was designed according to deeper insight than this, and the research results listed here reveal what they were.

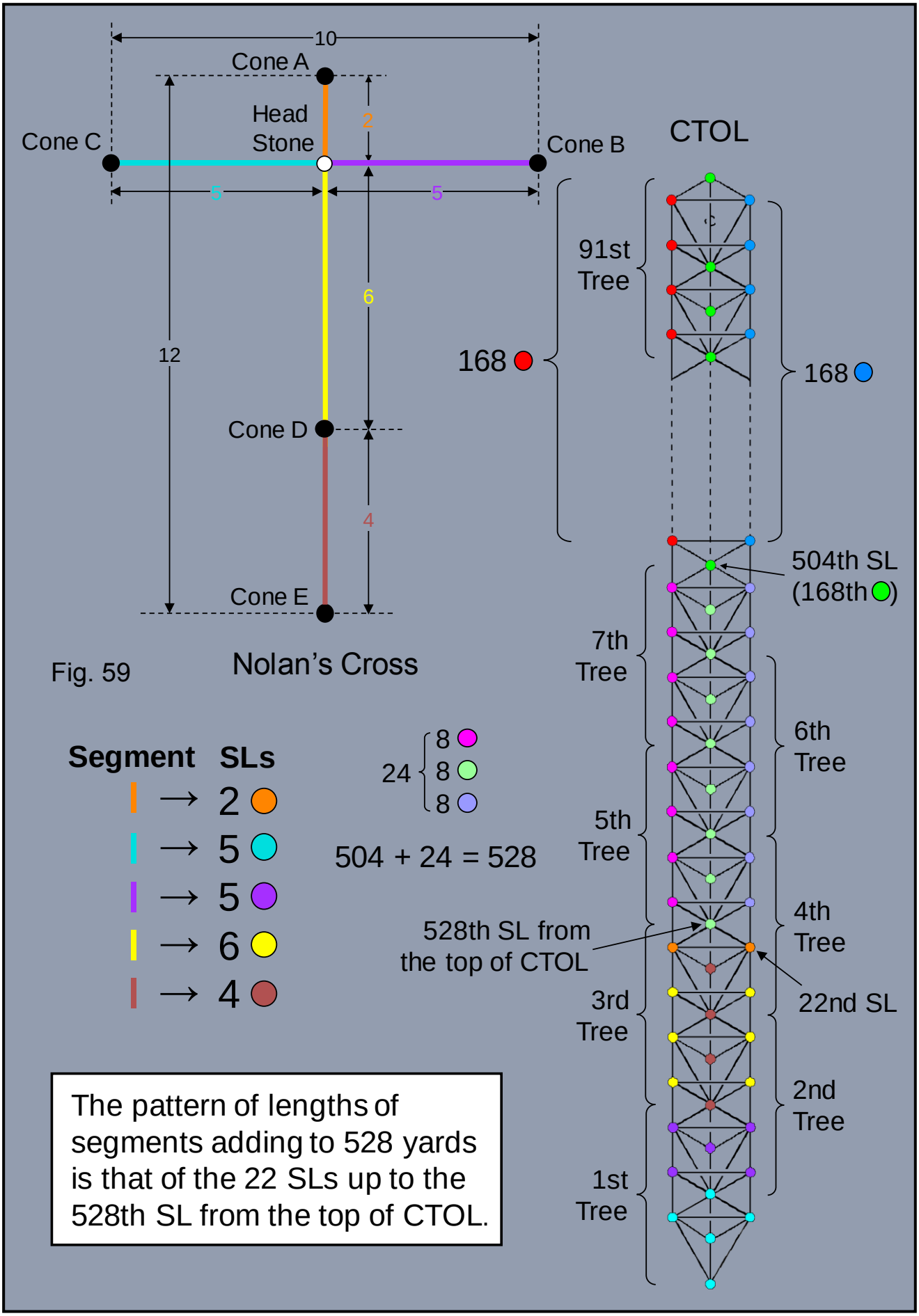

10
Cone A
Head
Stone
2
Cone C
Cone B
5
5
6
12
Cone D
4
Cone E
Nolan's Cross
CTOL
91st
Tree
168
168
504th SL
(168th)
7th
Tree
6th
Tree
5th
Tree
4th
Tree
528th SL from
the top of CTOL
22nd SL
3rd
Tree
2nd
Tree
1st
Tree
Segment SLs
→ 2
→ 5
→ 5
→ 6
→ 4
24
8
8
8
504 + 24 = 528
The pattern of lengths of segments adding to 528 yards is that of the 22 SLs up to the 528th SL from the top of CTOL.

Fig. 59

30. Nolan's Cross had to be 528 yards long

Question*: is there an SL in CTOL where the number of SLs down to it is the sum of the odd integers after 1 assigned to successive SLs below it? If so, is it unique?*

n^2 is the sum of the first n odd integers:

$$n^2 = 1 + 3 + 5 + \ldots + 2n-1,$$

so that $n^2 - 1$ is the sum of the (n−1) odd integers after 1. Suppose that the nth SL from the bottom of CTOL has this property. Then

$$550 - (n-1) = n^2 - 1,$$

that is,

$$(n+24)(n-23) = 0.$$

The only allowed solution is n = 23. The number of SLs in the n-tree = N(n) = 6n + 5. Therefore, N(3) = 23. The top of the 3rd Tree is the 528th SL from the top of CTOL and has 22 SLs below it. There are 168 SLs on the Pillar of Equilibrium down to the top of the 7-tree mapping the physical plane (Fig. 59) and (168+8=176) SLs down to the top of the 3-tree that maps the three dense physical subplanes; similarly, there are 168 SLs on each side Pillar down to the top of the 7-tree and 176 SLs down to the top of the 3-tree. 528 = 176×3, where 176 = 168 + 8. 168 is the number of SLs on each Pillar down to the top of the 7-tree and 8 is the number of further SLs on each Pillar down to the top of the 3-tree (23rd SL):

$$528 = 3\times168 + 3\times8 = 504 + 24.$$

504 is the number of SLs from the top of CTOL to the top of the 7-tree and 24 is the number of SLs below it to the top of the 3-tree.

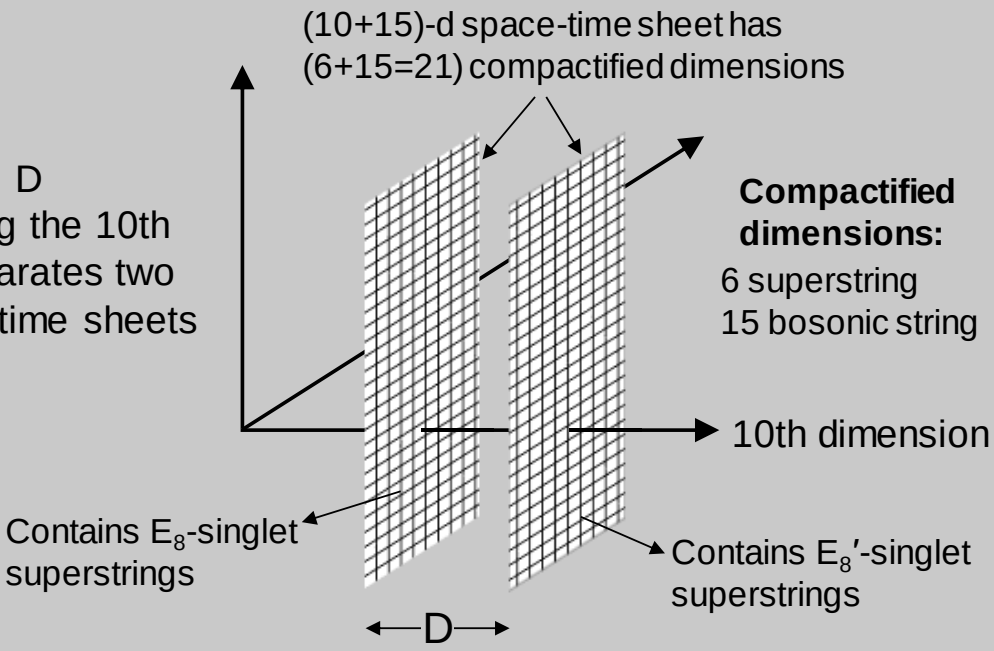
The 528th SL is unique in that the odd integers assigned to the 22 successive SLs below it add up to the same number as there are SLs down to it:

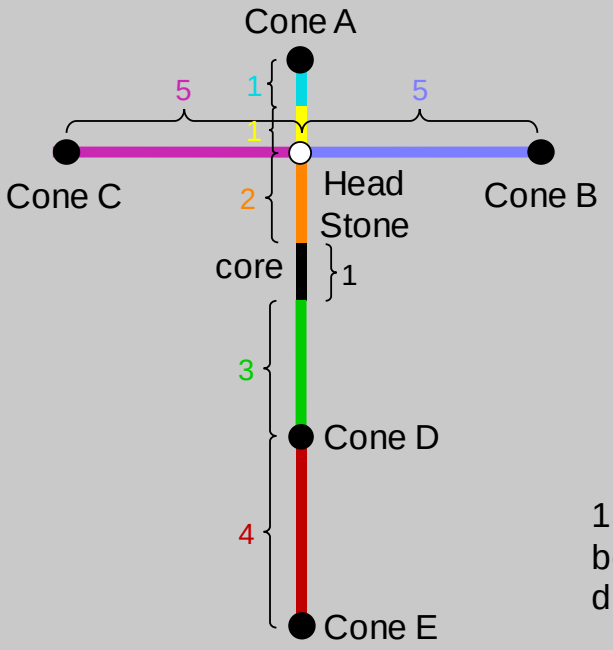
$$528 = 550 - 22 = 23^2 - 1 = 3 + 5 + \ldots + 45.$$

The 14 enfolded polygons of the inner Tree of Life have 94 sectors with 80 corners. The topmost corners of the two hexagons coincide with the lowest corners of the two hexagons enfolded in the next higher Tree. The number of corners of the 14n polygons in the inner form of the n-tree ≡ C(n) = 78n + 2. In the inner form of each Tree, two corners in each hexagon and the centres and two corners of the two triangles are shared with the outer Tree. The number of shared corners of sectors = 6n + 2. This leaves 72n corners that are intrinsic to the inner form of the n-tree. There are 72 intrinsic corners in the inner form of successive Trees. As 1584 = 22×72, the length in feet of Nolan's Cross is equal to the number of intrinsic corners of the (22×94=2068) sectors of the (22×14=308) polygons enfolded in every 22 Trees. The cross can be thought of as divided into 22 basic segments, each 72 ft long and representing the 72 intrinsic corners of sectors of polygons in the inner form of each Tree in a set of 22 Trees.

But to what do the 22 Trees refer? There are 10 SLs from the bottom of CTOL up to Chokmah of the 1st Tree and 12 more SLs up to Chokmah of the 3rd Tree. This 12:10 division is identical to the vertical and horizontal arms of Nolan's Cross. Figure 54 shows how the five major segments of the cross (as defined by pairs of adjacent stones) correspond to numbers of SLs equal to their length in units of 72 ft. When we represent these 22 SLs by 22 Trees — a procedure that is legitimate in terms of Kabbalah — their inner form has 1584 corners of sectors of polygons divided up into (10×72=720) corners in the inner form of the lowest 10 overlapping Trees and (12×72=864) corners in the inner form of the next 12 Trees, with matching numbers for Trees corresponding to individual segments. These numbers correspond to the horizontal arms of length 720 ft and the vertical arm of length 864 ft. What is remarkable is that there is a unique SL in CTOL 528 SLs from its top from which 22 SLs emanate whose Tree of Life representation has an inner form embodying the length of Nolan's Cross in feet, whilst this length in yards is 528! One is reminded of the Hermetic axiom "As above, so below." The significance of the number 528 is that it is the number of SLs down to the top of the 3-tree mapping what Theosophy calls the three "dense physical subplanes," or the physical universe. Beyond this are all invisible realms of being mapped by the 88 higher Trees of Life. They include the four Trees that map the four etheric subplanes of the physical plane. These have 24 SLs that consist of the eight SLs on each Pillar up to the top of the 7-tree. Above these are the 168 SLs on each Pillar that belong to the 84 Trees mapping the 84 subplanes of the 12 superphysical planes. The core segment of 24 yards corresponds to this transition through four Trees with 24 SLs and the three primary sections of 168 yards correspond to the 168 SLs on each Pillar of CTOL down to the top of the 7-tree that maps the physical plane. The core represents those levels and aspects of the physical plane that are invisible (at least to humans) but still physical. The rest of the cross represents all non-physical levels of reality. The complete cross *had* to be 528 yards long in order to depict — not all levels of existence — but all *invisible* levels, as mapped by the highest 88 Trees with (88×6=528) SLs.

A gap of length D extending along the 10th dimension separates two parallel space-time sheets

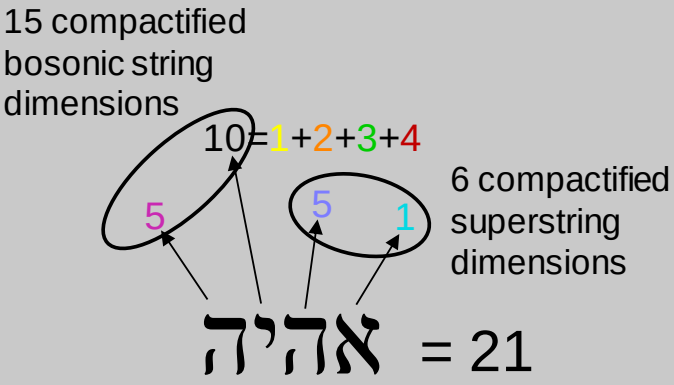




Nolan's Cross

(Numbers indicate numbers of segments of length 24 yards)

The 21 segments, each 24 yards long, that surround the core of Nolan's Cross correspond to the 21 compactified dimensions (6 superstring, 15 bosonic string) of each space-time sheet that is spaced along the 10th spatial dimension.



Ehyeh prescribes the 21 compactified dimensions in each 25-d space-time sheet occupied by E_8- or E_8'-singlet heterotic superstrings.

Fig. 60

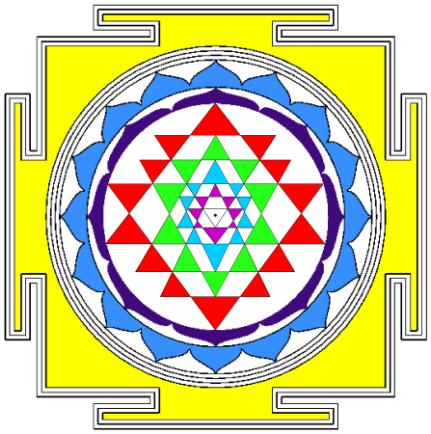
31. The dimensional meaning of the 22 segments

According to the theory of spinless, bosonic strings, space-time must have 26 dimensions for the quantum-mechanical description of their scalar fields to be consistent with the principle of causality (put technically, quantum-mechanical operators for their dynamical variables must commute when defined at two points in space-time separated by a space-like interval, i.e., when one point is outside the light cone of the other). As Minkowski space-time, which was an integral part of Einstein's theory of Special Relativity, is 4-dimensional, string theory requires 22 dimensions of space to exist that must be curled up, or "compactified." According to superstring theory, there are only six higher dimensions that form a compactified space because supersymmetry requires space-time to be 10-dimensional. In M-theory, which incorporates supergravity theories requiring 11-dimensional space-times with five types of superstrings, SO(32) superstrings are the product of the tenth dimension of space being a compact, 1-dimensional space (i.e., a circle), whilst $E_8 \times E_8'$ heterotic superstrings, whose vibrational modes combine oscillations in both 10-dimensional and 26-dimensional space-times, result from one dimension being a finite segment, with E_8-singlet superstrings being confined to a 10-dimensional space-time sheet at one end of this gap and E_8'-singlet states being confined to a parallel sheet at its other end (Fig. 60). Neither class of superstring can cross over this gap, so that only gravitational forces can act between them. Is it a coincidence that the Hebrew alphabet has 22 letters, the outer Tree of Life of Kabbalah has 22 Paths and Nolan's Cross can be divided up into 22 segments, each 24 yards long, so that all vertical and horizontal distances between stone markers are integer multiples of this basic length? Is it just chance that the cross is of length 528 yards and that this is the number of SLs in CTOL below which there are 22 SLs? Of course not! They are all expressions of a transcendental design.

Given the correspondence between segments and compactified dimensions of space, the question arises: what segments correspond to which dimensions? The key to answering this is to realise that three sections of the cross, spread out over 21 segments, surround its core segment, just as 21 spatial dimensions determine both the 9-dimensional form of the superstring and its $E_8 \times E_8'$-symmetric forces, the remaining dimension simply separating the two space-time sheets containing E_8-singlet and E_8'-singlet states. In other words, *this dimensional gap is the counterpart of the core segment*. As also indicated in Section 28, the Hebrew letters making up the Divine Name Ehyeh (אהיה), meaning "I am," are associated with various segments. The value 10 of the letter yod cannot be associated with the length of 10 units of the vertical arm up to the horizontal arms because it contains the core segment, which stands apart from the 21 segments prescribed by Ehyeh with the gematria number value of 21. It seems natural to associate the value 5 of each letter he to each arm with length 5 units, for otherwise they would have to be associated with various segments that are unmarked by stones, and this seems unlikely. The number 1 of alef and the number 5 of one of the letters he add up to 6, which is the number of compactified dimensions of superstrings. The sum 15 of the letter yod and the other letter he denotes the 15 remaining dimensions outside the 11-dimensional space-time predicted by M-theory. The number 10 of the letter yod is the length in units of 24 yards of the vertical arm minus the core segment and the unit length segment (coloured turquoise in Fig. 55), which is associated with the letter alef. This part of the cross has a length of 240 yards; the two arms corresponding to the two identical letters he also have a total length of 240 yards. This 240:240 division created by the first three letters of the Divine Name אהיה correspond to the 240 roots of E_8 and the 240 roots of E_8' in $E_8 \times E_8'$ (see Section 12).

As pointed out at the beginning of this section, physicists have proved that the space-time of bosonic strings must have 26 dimensions in order to be consistent with quantum mechanics. This is the number value of Yahweh (YHVH, יהוה), the Divine Name assigned to Chokmah, which is the next Sephirah after Kether. As with Ehyeh, the Divine Name assigned to Kether, the sum of the letter values of yod and he is 15; the sum of the letter values of vav and the second letter he is 11, which is the dimensionality of space-time predicted by M-theory. The value 6 of vav is the number of compactified dimensions of superstrings and the value 5 of he is the sum of the four dimensions of Einstein's space-time and the dimensional segment separating the two parallel space-time sheets of $E_8 \times E_8'$ heterotic superstrings.

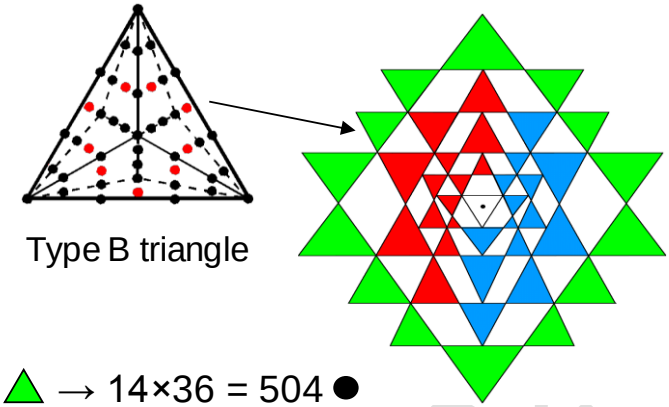
Fig. 61



Sri Yantra

46 yods = 9 ● + 37 ●

Fig. 62



Type B triangle

14 △ → 14×36 = 504 ●
14 △ → 14×36 = 504 ●
14 △ → 14×36 = 504 ●

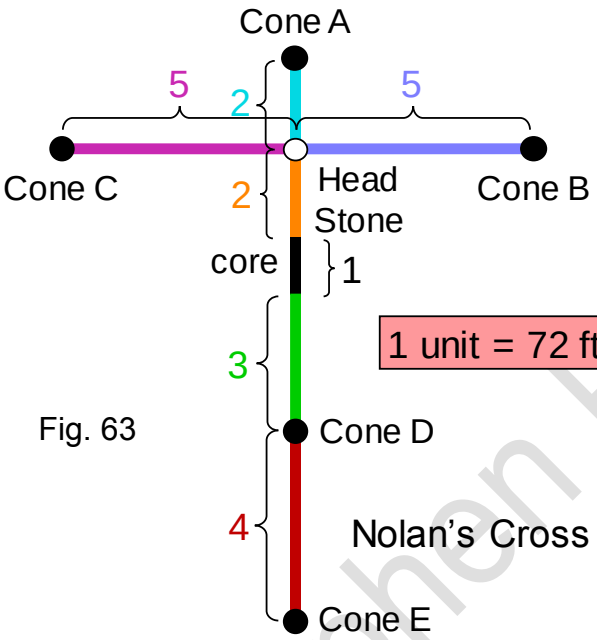


Fig. 63

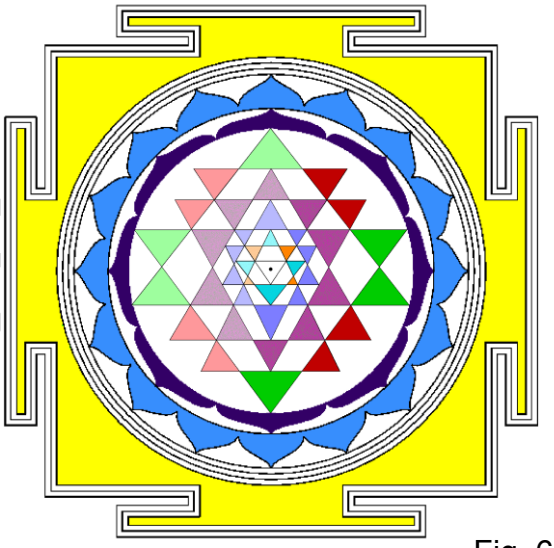


Fig. 65

42×36 = 21×72 = 1512.

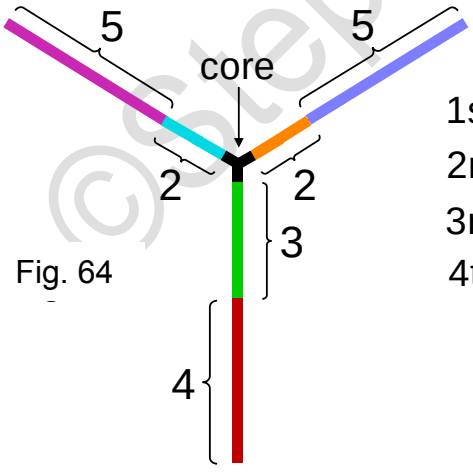


Fig. 64

	Left half	Right half
1st layer:	2△ + 2△	2△ + 2△
2nd layer:	5△	5△
3rd layer:	5△	5△
4th layer:	4△ + 3△	4△ + 3△
	7	7

The 5:2 & 4:3 divisions in the segments of Nolan's Cross correspond to the pair of (5+2) triangles in the first 3 layers and the (4+3) triangles in the 4th layer.

(cone symbols are omitted for the sake of clarity)

32. More correspondences between Nolan's Cross and the Sri Yantra

We saw in Section 19 (p. 40) that the 42 triangles surrounding the central one in the 3-dimensional Sri Yantra (Fig. 61) have 1512 yods lining tetractyses when they are Type B triangles. This compared with the total length of 1512 ft of the three main sections of Nolan's Cross that surround the core segment of 72 ft. Furthermore, we pointed out that the 42 triangles consist of 14 triangles in the fourth layer (coloured green in Fig. 62) and 14 triangles in the left-hand (red) and the right-hand (blue) halves of the first three layers; this hidden division into three sets of 14 triangles with (14×36=504) yods lining the 126 tetractyses in each set corresponds in the cross to its branching into three main parts, each 504 ft long. In this section the pattern of the triangles in each set is shown to provide confirmation of this correspondence.

The three sections of the cross shown in Fig. 63 and its Y-shaped equivalent shown in Fig. 64 are:

Cone C-Head Stone-Cone A:	5 + 2 = 7	7×72 = 504;
Cone B-Head Stone- core:	5 + 2 = 7	7×72 = 504;
Cone E-Cone D-core:	4 + 3 = 7	7×72 = 504.

The central vertical axis of the Sri Yantra acts as a mirror in the sense that each of the 17 triangles in one half has its mirror-image counterpart in the other half, with eight triangles straddling the axis. Although the four upper triangles are not the exact mirror-images of the four lower ones, they can be associated with one of the two halves. Let us associate the four lower, central triangles with the right half and the four upper, central triangles with the left half. Because of the mirror symmetry in their distribution, the 42 triangles can be divided into two sets of 21 triangles. The composition of triangles in the four layers is:

	left half	**right-half**
1st layer:	4	4
2nd layer:	5	5
3rd layer:	5	5
4th layer:	7	7

Each set of four triangles in the first layer consists of, firstly, a pair (dark/light turquoise) whose outward-pointing corners appear to touch the sides of triangles in the 2nd layer (being in three dimensions, the point is actually directly above a point on this line) and, secondly, a pair (dark/light orange) whose outward-pointing corners are directly above the meeting of corners of triangles in the 2nd layer. Let us associate the former pair with the five triangles in the 3rd layer and the latter pair with the five triangles in the 2nd layer. In the two mirror-image sets of 14 triangles, there are then (5+2=7) triangles in the right half and (5+2=7) triangles in the left half. As Fig. 62 shows, there are 36 boundary yods per Type B triangle, so that their total number in the 14 triangles in each half of the first three layers = (5+2)×36 + (5+2)×36 = (5+2)×72 = 7×72 = 504. This pattern corresponds to the two sections of the cross that are each made up of a horizontal arm five units long (360 ft) and one segment two units long (144 ft). The former corresponds to the two sets of five triangles in either half; the latter corresponds to the four triangles in the 1st layer.

Now let us examine the 14 triangles in the 4th layer. Corners of three (dark/light green) triangles touch the inner ring of eight lotus petals (*Sarva Samkshobahana*), the four remaining (dark/light red) triangles in each half not touching it. There are (4+3=7) triangles in each half of the 4th layer. The eight non-touching triangles have (8×36=4×72=288) boundary yods; the six touching triangles have (6×36=3×72=216) boundary yods. This pattern corresponds to the Cone D-Cone E distance of four units (288 ft) and to the distance of three units (216 ft) between Cone D and the beginning of the core segment (indicated in Fig. 63 by a vertical, black line). The 3:4 division in the two lowest segments of the cross forming one of the three major sections 504 ft long corresponds to six touching and eight non-touching triangles in the 4th layer of the Sri Yantra, whilst the 2:5 division in the two other major sections corresponds to the association in each half of the Sri Yantra of two of the four triangles in the 1st layer with five triangles in the 2nd layer and of the remaining two triangles with the five triangles in the 3rd layer.

Crucial to the establishment of this analogy is the fact that the 3-dimensional Sri Yantra has two layers, each with five triangles in each half. The implication of this feature is that the 504 boundary yods in the set of triangles to which they belong divide into *two* equal groups of 252. This is necessary because each yod denotes the length of one foot and 504 feet is 168 yards, the number 168 being a characteristic parameter of sacred geometry (and holistic systems in general) that *always* exhibits the division: 168 = 84 + 84, as exemplified by Fig. 40. As the four triangles in the 1st layer are of two classes and an equal number of triangles belongs to each class, the ten triangles in either half of the 2nd and 3rd layers must group into two equal subsets of five in order to generate identical numbers 252, thereby dividing in half the equivalent number 168 in yards. The 3rd layer achieves this by repeating the number of triangles that is in the 2nd layer. Although triangles in the 3rd and 4th layers are also of two classes because they have corners like those in the 1st layer, they form subsets of four and six, not two equal subsets of five. Only the repetition of five triangles can account for both arms of the cross having the same length.

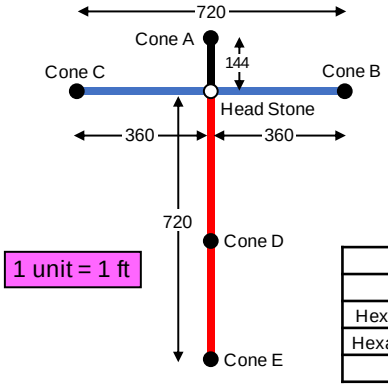
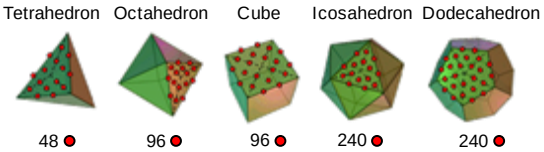


Fig. 66



				Total
Upper half:	120	120	120	360
Lower half:	120	120	120	360
Total	240	240	240	720

Number of hexagonal yods in the faces of the 5 Platonic solids

	Tetrahedron	Octahedron	Cube	Subtotal	icosahedron	Dodecahedron
Hexagonal yods on edges	6×2 =12	12×2=24	12×2=24	60	30×2=60	30×2=60
Hexagonal yods on sides of tetractyses	12×2=24	24×2=48	6×8=48	120	20×6=120	12×10=120
Hexagonal yods at centres of tetractyses	4×3=12	8×3=24	6×4=24	60	20×3=60	12×5=60
Total =	48	96	96	240	240	240

Constructed from tetractyses, the 50 faces of the 5 Platonic solids contain 720 hexagonal yods. The 360 hexagonal yods in their upper or lower halves correspond to the 360 ft length of each horizontal arm of Nolan's Cross.

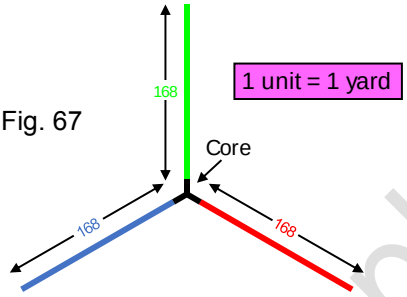
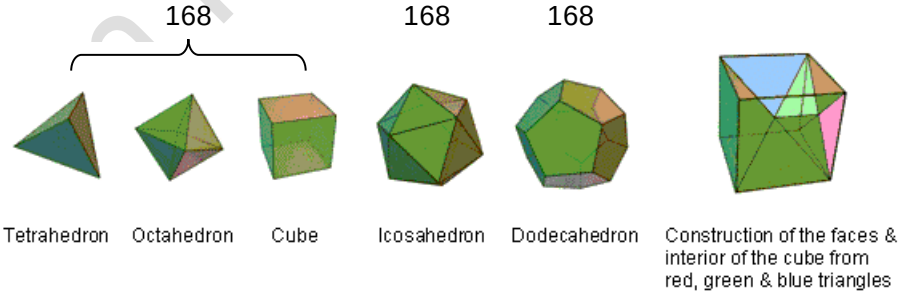


Fig. 67

Contribution to the 504 geometrical elements on average surrounding the axis of a Platonic solid



On average, 504 points, lines & triangles surround the axis of a Platonic solid. They correspond to the total length of 504 yards of the three sections of Nolan's Cross that surround the core segment 24 yards in length (symbolised by the black Y-shape with each arm eight yards long at the centre of a Y-shape whose arms are 168 yards long).

33. The three-fold division of Nolan's Cross and its counterpart in the five Platonic solids

The five Platonic solids have either triangular, square or pentagonal faces. Suppose that their regular polygonal faces are divided into their sectors that are then turned into tetractyses. The table in Fig. 66 lists the numbers of hexagonal yods either at centres of tetractyses or lining their sides. The tetrahedron, octahedron & cube have 240 hexagonal yods in their faces, as do the icosahedron and the dodecahedron. The five Platonic solids have 720 hexagonal yods. Their counterpart in Nolan's Cross is the length of 720 ft between Cone B and Cone C marking the ends of its horizontal arms. The 360 ft length of each arm corresponds to the 360 hexagonal yods in their upper or lower halves.

Consider a Platonic solid with V vertices, E edges and F faces that are regular n-gons (n = 3, 4 or 5). The cube shown on the right in Fig. 67 is an example of how the faces and interiors of Platonic solids can be constructed from triangles. Dividing their faces into their nF sectors (the red triangle in the diagram is such a sector) generates F corners, so that the Platonic solid has (V+F) corners and (E+nF) sides of nF triangles in its faces. Joining its V vertices to its centre creates V sides of E internal triangles (the blue triangle is an example). When the latter are Type A triangles, there are also E corners and 3E sides of 3E sectors. Joining the F centres of faces to the centre of the solid generates F internal sides and nF internal triangles (the light green triangle is an example). When these triangles are Type A, nF corners and 3nF sides of 3nF sectors are added. Table 1 tabulates the number of geometrical elements surrounding the centre of a Platonic solid:

Table 1. Geometrical composition of a Platonic solid.

	Corners	Sides	Triangles	Total
Faces	V + F	E + nF	nF	2 + 2E + 2nF
Interior	E + nF	V + F + 3E + 3nF	3E + 3nF	2 + 8E + 7nF
Total =	2 + 2E + nF	2 + 5E + 4nF	3E + 4nF	4 + 10E + 9nF

(Euler's polyhedral formula for a simply-connected polyhedron:

$$V - E + F = 2$$

has been used to simplify the expressions). The number "2" in the expression for the geometrical composition of the faces can be interpreted as the two vertices lying on an axis that passes through the centre of the polyhedron. The number "2" in the expression for the composition of the interior denotes the two sides shared by some internal triangles that form this axis. The number "4" in the expression for the total number of geometrical elements denotes the two vertices and the two sides surrounding the centre that make up the axis of the Platonic solid. The number of corners, sides & triangles surrounding this axis = 10E + 9nF. Table 2 lists the geometrical composition of the five Platonic solids:

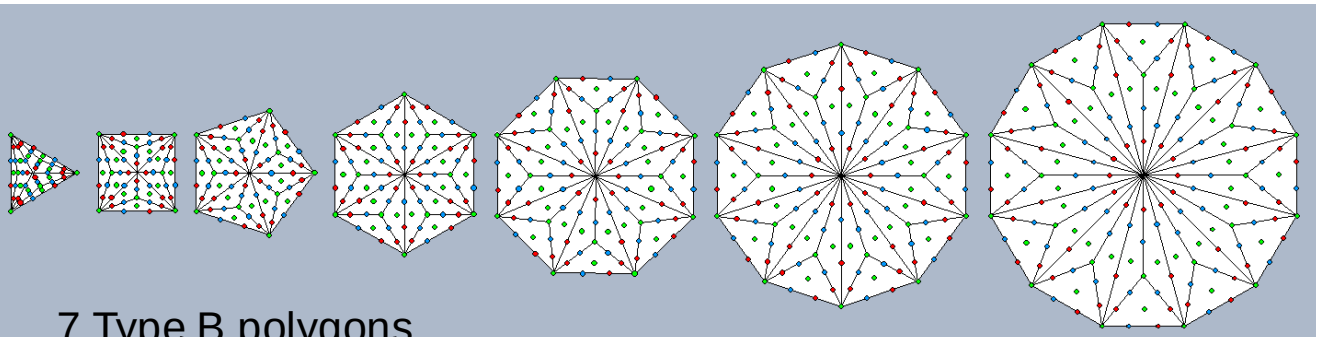
Table 2. Number of geometrical elements surrounding the axis of a Platonic solid.

Platonic solid	Edges (E)	n	Faces (F)	Total = 10E + 9nF	Contribution to average Platonic solid = Total/5
Tetrahedron	6	3	4	168	168
Octahedron	12	3	8	336	
Cube	12	4	6	336	
Subtotal =	30	–	18	840	
Icosahedron	30	3	20	840	168
Subtotal =	60	–	38	1680	336
Dodecahedron	30	5	12	840	168
Total =	90	–	50	2520	504

(168+336+336=840) geometrical elements surround the axes of the tetrahedron, octahedron and cube (similarly for the icosahedron and the dodecahedron). The total number of such geometrical elements for the five Platonic solids is 2520. On average, (2520/5=504) geometrical elements surround the axis of a Platonic solid, the first three Platonic solids contributing (840/5=168) elements to this figure, the icosahedron contributing (840/5=168) elements and the dodecahedron contributing (840/5=168) elements (Fig. 67). Each half of either the first three, the fourth or the fifth Platonic solid contributes 84 elements. This 84:84 division is characteristic of holistic systems. Article 64 at the author's website provides eight examples. See also:

http://smphillips.mysite.com/wonders-of-superstrings-42.html

This 3×168 pattern in the contribution by the five Platonic solids to the 504 geometrical elements surrounding on average the axis of a Platonic solid corresponds to the 168 yards in each of the three sections of Nolan's Cross that surround its centre core of length 24 yards. The correspondence exists because, being expressions of *mathematically complete* systems, they must embody *similar* archetypal patterns of numbers that parameterise their global properties.

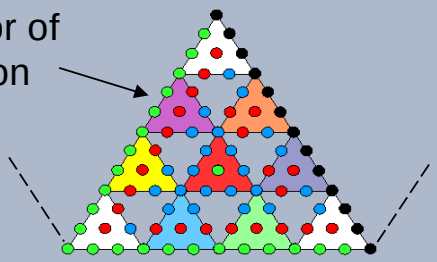


7 Type B polygons

720 { 240 ● 240 ● 240 ●

Fig. 68

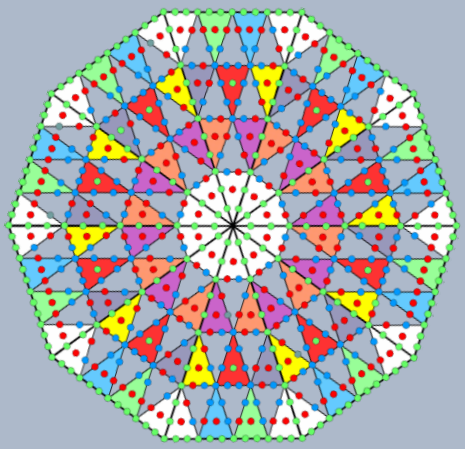
Sector of n-gon



Total number of yods per sector = 72 = 24 ● + 24 ● + 24 ●

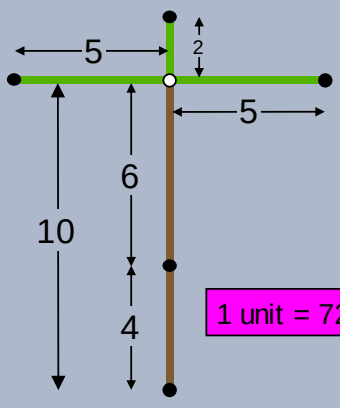
Fig. 69

Decagon

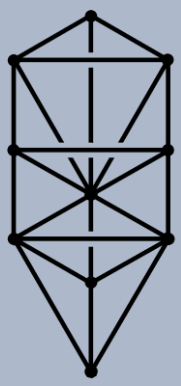


720 = 240 ● + 240 ● + 240 ●

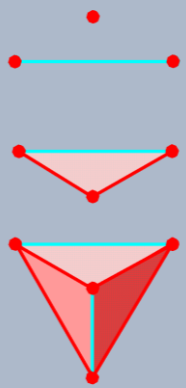
N units of length = 72N ft = N(24+24+24) ft = 24N(1+1+1) ft = 24N yards.
Each foot in a yard measured between the cones of Nolan's Cross corresponds to a yod in one of the three sets of 24 yods per sector of an N-sided polygon (3≤N≤12).



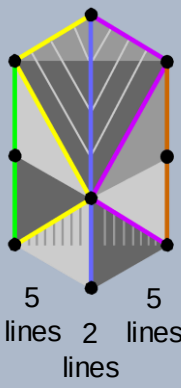
Nolan's Cross



Outer Tree of Life



Trunk
(4+6=10) lines



Branches
(5+2+5=12) lines

Fig. 70

The outer Tree of Life comprises its trunk and branches. The vertical arm of length 10 units corresponds to the trunk (point-line-triangle-tetrahedron) with 10 straight lines (sides of 5 triangles). The four horizontal or vertical turquoise lines correspond to the distance of four units between Cone E and Cone D and the six inclined red lines correspond to the distance of six units between Cone D and the Head Stone. Its branches comprise 12 straight lines (sides of 11 triangles). The two central blue lines in the branches correspond to the distance of two units between Cone A and the Head Stone. The five lines on either side of them correspond to the two horizontal arms of length five units.

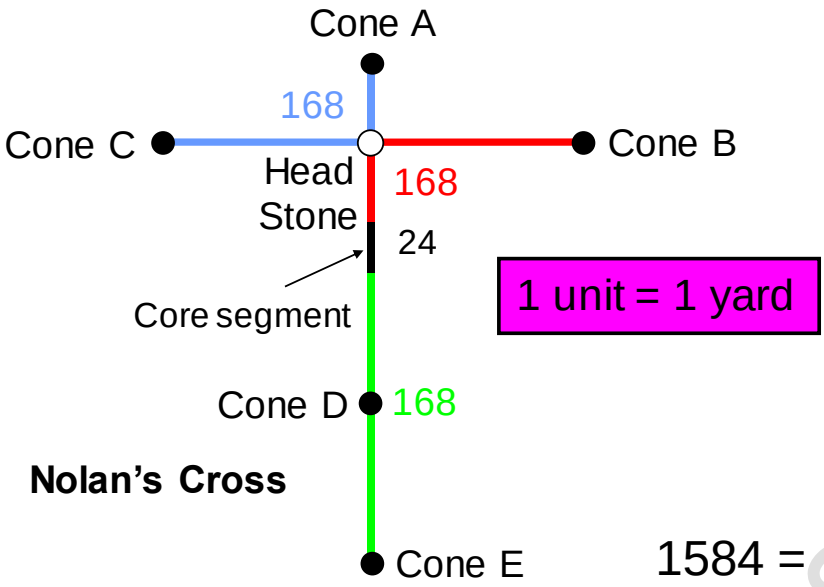
34. The three-fold nature of the holistic parameter 720

We saw in Section 31 how the three-fold division: 1512 = 3×504 of the three sections of Nolan's Cross that surround its central core manifests in the 3-dimensional Sri Yantra as its three groups of 14 Type B triangles, each with 36 yods lining sides of tetractyses: 1512 = 3×14×36. We saw in Section 32 that the same division, now expressed in yards: 504 = 3×168, manifests in the contribution made by the first three Platonic solids, the fourth and the fifth Platonic solid to the average number of points, lines & triangles that surround their axes. We shall now show that it also appears in the inner Tree of Life when its seven types of polygons are all Type B (Fig. 68). There are five sides and two corners of three tetractyses per sector of a Type B polygon. Therefore, there are (2+3=5) yods that are either corners or hexagonal yods at centres of tetractyses and five pairs of hexagonal yods lining their sides, i.e., two sets of five hexagonal yods. The 15 yods per sector divide up into three classes of five yods. The centres of the seven separate Type B polygons are surrounded by 48 sectors with (48×15=720) yods made up of three classes of (48×5=240) yods (coloured red, green & blue in Fig. 68). This is the inner Tree of Life counterpart of the 720 hexagonal yods in the faces of the five Platonic solids being made up of the 240 hexagonal yods in the faces of the tetrahedron, octahedron & cube, the 240 hexagonal yods in the faces of the icosahedron and the 240 hexagonal yods in the faces of the dodecahedron (see Fig. 66).

This triple division exists in the basic unit of 72 ft that turns distances between the stone markers of Nolan's Cross into integers N, where 2≤N≤12. It is not simply because of the trivial, arithmetic fact that 72 is exactly divisible by the number 3. The reason why these integers appear when the unit of distance is 72 ft is that straight lines marked out by stone boulders were used to express through their length in feet the yod population of polygons that belong to the inner form of the Tree of Life. Constructed from 2nd-order tetractyses, a polygon with N corners has 72N yods surrounding its centre. A straight line of length 72N ft represents a polygon with N corners, each foot of length corresponding to a yod. The 72 yods per sector comprise 1. 24 green yods (Fig. 69) that either line two sides of the sector or are at its centre, 2. 24 red yods that either line sides of the nine tetractyses surrounding the central one or are at their centres, and 3. 24 blue yods that line sides of tetractyses. In other words, the 72 yods comprise *three* classes of 24 yods, or, alternatively, 24 sets of one red yod, one green yod & one blue yod. Nolan's Cross consists of 22 basic segments of 24 yards. Whenever a yard is measured out along its arms, its three foot lengths correspond to one red yod, one green yod and one blue yod of a polygon. The Cones themselves mark out a square (Cone D-Cone E), an octagon (Cone A-Cone D) and a decagon (Cone B-Cone C). As a unit of length, the yard uniquely expresses the triple division of each 2nd-order tetractys sector of the polygon into 24 sets of three yods, each yod symbolising the basic length of one foot.

The 22 straight lines (Paths) of the outer Tree of Life consist of the 10 straight lines making up its trunk and the 12 lines that comprise its branches (Fig. 70). The former is made up of three horizontal lines and one vertical line, i.e., four lines that are their own mirror images, and two sets of three inclined lines, one set the mirror image of the other, i.e., six lines. This 4:6 division is marked out in the vertical arm of the cross as the four units of distance between Cones D and E and the six units of distance between Cone D and the Head Stone. The 12 lines making up the branches of the outer Tree of Life comprise the two blue, vertical lines aligned with the central Pillar of Equilibrium, five lines on its left-hand side and five lines on its right-hand side. This 5:2:5 division is marked out in Nolan's Cross as the five units of distance in its left arm, the two units of distance in the vertical segment and the five units of distance in its right arm. The vertical line 10 units long up to the Head Stone denotes the trunk of the outer Tree of Life. The horizontal arms and uppermost, vertical segment with a total length of 12 units denote its branches.

Length of Nolan's Cross = 528 yards = 1584 ft



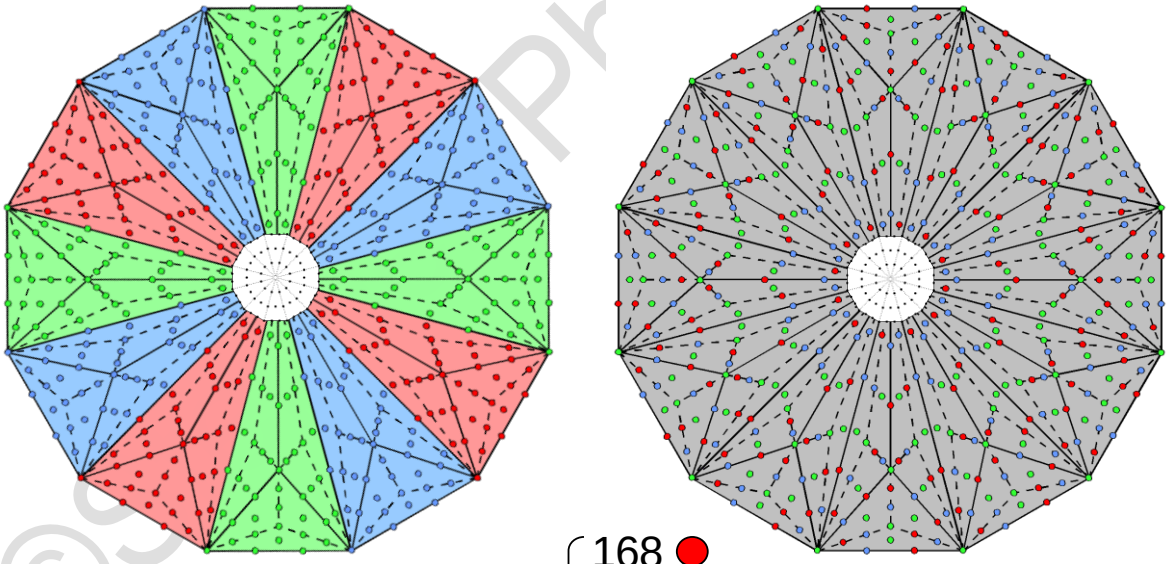
168

168 168

1584 = 168 72 168

168 168 168 168

Fig. 71



504 { 168 168 168

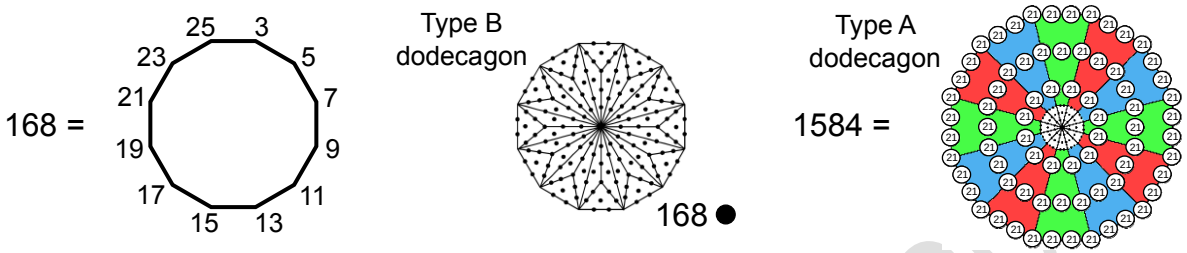
a b

The Type C dodecagon with the Type A dodecagon at its centre

The dodecagon determines both the unit of length and the total length of Nolan's Cross

35. The dodecagon determines both the unit of length and the total length of Nolan's Cross

The dodecagon is the last of the seven types of regular polygons making up the inner form of the Tree of Life. These seven types are the polygonal expression of the seven Sephiroth of Construction, with the three regular polygons absent from this set, namely, the heptagon, nonagon & undecagon, playing the archetypal role of the Supernal Triad of Kether, Chokmah & Binah. As the tenth type of regular polygon, the dodecagon corresponds to Malkuth, the tenth Sephirah. It should therefore not be surprising that it determines the basic structural parameter 168 of Nolan's Cross, which comprises three segments, each 168 yards long, that surround the core segment that is 24 yards (72 ft) long (indicated in Fig. 71 by the black vertical line). The dodecagon achieves this both arithmetically and geometrically. As $13^2 - 1 = 168$, it is the sum of the first 12 odd integers after 1 that can be assigned to the 12 corners of a dodecagon:

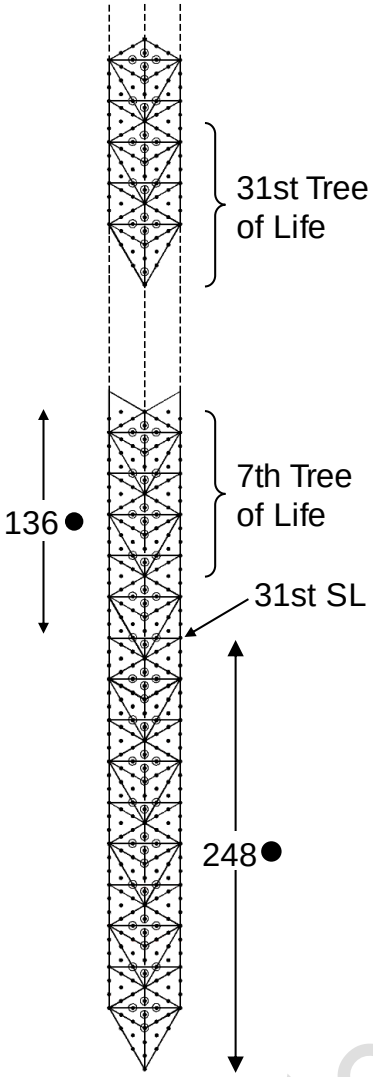


There are 15n yods surrounding the centre of a Type B n-gon with n corners. The number of additional yods needed to turn an n-gon into a Type B n-gon is 14n. For the dodecagon (n=12), the number is 168. Weighted with the number value 21 of Ehyeh (see p. 60), the 72 yods surrounding the centre of the Type A dodecagon generate the number 1512 as the length of the three sections of Nolan's Cross that surround its core 72 ft long, which is symbolised by the 72 yods of another Type A dodecagon at its centre.

The number of yods surrounding the centre of a Type A n-gon is 6n. The dodecagon has 72 such yods. This number is the number of feet in the unit of length that turns into integers the distances between the stone markers of Nolan's Cross. As just mentioned, it is also the length of the core segment, surrounding which are the three sections, each of length (3×168=504) ft. This means that the total length (1584 ft) of the cross can be represented by a tetractys with nine equal numbers 168 on its perimeter and the number 72 at its centre. The green 168s at its corners measure the 168 yards length of the green, vertical arm up to the core and the two triplets of red or blue 168s at the corners of a hexagon measure the 168 yards length of the two other sections (coloured red and blue in Fig. 71).

It was shown on page 32 that, apart from its centre, 33n yods line the sides of the 9n tetractyses making up the sectors of a Type C n-gon. Including the hexagonal yods at the centres of these tetractyses, the number of yods surrounding the centre of the Type C n-gon = 33n + 9n = 42n. A Type C dodecagon (n=12) has (12×42=504) yods surrounding its centre. The 12 sectors of the dodecagon labelled "a" in Fig. 71 are coloured red, green & blue in order to indicate that they form three cross pattées. The four arms of each cross contribute (4×42=168) yods of the same colour. Every yod symbolises a yard length in the 168 yards making up each of the three sections of Nolan's Cross. A Type A dodecagon at the centre of the Type C dodecagon has 72 yods surrounding its centre. They denote the 72 feet length of the core segment. By inspecting each Type B triangular sector, it is easily ascertained that 14 of the 42 yods per sector are either corners of nine tetractyses or hexagonal yods at their centres. In the dodecagon labelled "b", they are coloured green. The remaining 28 yods per sector consist of pairs of hexagonal yods lining sides of tetractyses, so that they form two sets of 14 yods (coloured either red or blue). Therefore, the 42 yods per sector form three sets of 14 yods, and the 504 yods in the Type C dodecagon comprise three sets of 168 yods, namely, 168 green corners or centres of tetractyses, 168 red hexagonal yods & 168 blue hexagonal yods. They correspond to, respectively, the 168 yards of the green, vertical arm of Nolan's Cross up to the core, the 168 yards of the L-shaped, red section formed by its right-hand arm and the 168 yards of the L-shaped, blue section formed by its left-hand arm. As with the dodecagon labelled "a", the Type A dodecagon with 72 yods shown at its centre denotes the core segment 72 ft long.

In conclusion, the dodecagon determines both arithmetically and geometrically through its construction from tetractyses the basic unit of length (72 ft) underlying the layout of Nolan's Cross. In addition, as its vertical arm is 12 units long, it determines this as well because a dodecagon with 2nd-order tetractyses as its sectors has (12×72=864) yods, comparing with its length of 864 ft. Finally, the 12 sectors of the dodecagon create three cross pattées that correspond to the three sections of Nolan's Cross because each cross contains 168 yods denoting the 168 yards length of each section. As we found in Section 21, each section expresses one of the three Pillars of CTOL However, its 168 yards correspond only to the 168 SLs that lie on the corresponding Pillar as far down CTOL as the 7-tree mapping the physical plane, i.e., not *all* CTOL but only its *superphysical* levels. The 24 yards of the core correspond to the 24 SLs that span the four Trees mapping the four etheric subplanes of the physical plane (see pages 54 & 60).



אל = 31
30 1

The n-tree has (12n+7) triangles with (6n+5) corners and (16n+9) sides.
Number of yods in the n-tree ≡ Y(n) = 6n + 5 + 2(16n+9) + 12n + 7 = 50n + 30.
There are four yods outside the n-tree up to the level of its apex.
Number of yods up to the level of the nth Tree of Life ≡ N(n) = Y(n) + 4 = 50n + 34.
Number of yods up to the level of the 31st Tree = N(31) = 1584.

$$N(7) = 384 = 2^2 + 3^2 + 4^2 + 5^2 + 6^2 + 7^2 + 8^2 + 9^2 + 10^2.$$

Number of SLs up to Chesed of the nth Tree = 6n + 1.
Number of yods up to this SL = 50n – 2.
There are 248 yods up to Chesed of the 5th Tree (31st SL) and (384–248=136) yods above it up to the level of the 7th Tree of Life. The 31st SL is the 137th yod from the latter and the 248th yod from the nadir of the 7-tree:

$$137 + 248 = 385 = 1^2 + 2^2 + 3^2 + 4^2 + 5^2 + 6^2 + 7^2 + 8^2 + 9^2 + 10^2.$$

The dimension of the rank-8, exceptional Lie group E_8 is 248. The fine-structure number 137 specifies the location of the SL in the 7-tree mapping the physical plane (space-time) up to which there are 248 yods symbolising the 248 roots of E_8. The Godname EL ("God") with number value 31 is assigned to Chesed. The lowest 31 SLs determine the dimension 248 of E_8 and the lowest 31 Trees determine the number 1584, which is the number of yods in the separate outer (214) and inner (1370) Trees of Life: 214 + 1370 = 1584. This number is prescribed by the Godname Adonai with number value 65 because there are 65 SLs on the Pillar of Equilibrium of the 31-tree. The Decad (10) determines the 31-tree because 65 is the sum of the first 10 integers after 1:

$$65 = 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11,$$

whilst its apex is the 120th SL on the Pillar of Equilibrium from the apex of CTOL, where 120 is the sum of the first 10 odd integers after 1:

$$120 = 11^2 - 1 = 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21.$$

Fig. 72. How the Divine Name El prescribes the total length of Nolan's Cross.

36. The Divine Name El prescribes the total length of Nolan's Cross

The n-tree is the lowest n Trees of any number of overlapping Trees of Life. When its triangles are turned into tetractyses, they contain (50n+30) yods (for proof, see Fig. 72). Two yods below the apex of the n-tree lie outside it on each side of the central Pillar of Equilibrium. This means that the number of yods up to the level of the top of the n-tree = 50n + 34. The 31-tree has 1584 such yods. This equals the number of feet between the five Cones in Nolan's Cross.

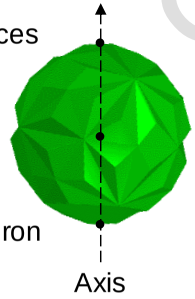
What is the significance of the number 31? In Kabbalah, the function of each Sephirah is expressed in Atziluth (the Archetypal World) as its Godname, in Beriah (World of Creation) as its Archangel, in Yetzirah (Formative World) as its Order of Angels and in Assiyah (World of Action) as its Mundane Chakra. Gematria is the ancient practice of turning words into numbers as the sums of their letter values. The Divine Name assigned to a Sephirah has a number value that characterises its metaphysical meaning. The Godname El (אל), meaning "God," is assigned to Chesed, the first of the seven Sephiroth of Construction. Its number value is the sum of the value 1 of alef (א) and the value 30 of lamed (ל). Hence, the Godname El prescribes the very number of overlapping Trees of Life whose number of yods up to their apex equals the number of feet between the five Cones in Nolan's Cross! As pointed out at the beginning of Section 1, the number value of Chesed is 72, which is the number of feet that constitutes the unit of length underlying the layout of Nolan's Cross.

It is easily ascertained that there are 65 SLs on the Pillar of Equilibrium of the 31-tree. This number is the gematria number value of Adonai (אדני), the Godname assigned to Malkuth, which is the seventh Sephirah of Construction. It is the sum of the first 10 consecutive integers after 1. The Decad (10) also determines the top of the 31-tree as the 120th SL on the Pillar of Equilibrium from the top of CTOL, where 120 is the sum of the first 10 consecutive, odd integers after 1.

Above Chesed of the fifth Tree (the 31st SL), there are 136 yods up to the level of the apex of the 7-tree that maps the physical plane. The 31st SL is therefore the 137th yod, counting from the top of the 7-tree. It is the 248th yod, counting from the bottom of the 7-tree. This shows how the fine-structure number 137, whose reciprocal is approximately equal to the fine-structure constant $e^2/\hbar c$ well-known to physicists, determines the dimension 248 of E_8, i.e., its number of roots, E_8 being the symmetry group that manifests in the theory of $E_8 \times E_8'$ heterotic superstrings. It is, of course, not a property that has any counterpart in Nolan's Cross. However, the top of the 7-tree, which maps the 10 dimensions of superstring space-time, is the 504th SL from the top of CTOL, and this number *is* relevant, being the length in feet of each of the three primary sections of Nolan's Cross.

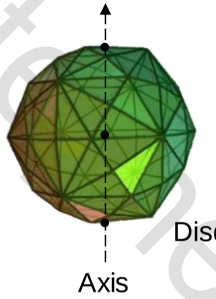
Polyhedral Tree of Life

(2+72=74) vertices
216 edges
144 faces



144 Polyhedron

Axis



Axis

(2+60=62) vertices
180 edges
120 faces

Disdyakis triacontahedron

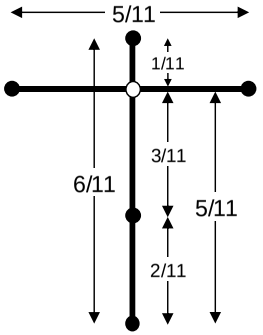
Number weights for a polyhedron with (2+V) vertices, 3V edges & 2V faces, with all vertices joined to its centre

	Corners	Sides	Triangles	Total
Faces	1	3	2	6
Interior	0	1	3	4
Total	1	4	5	10

(For the Polyhedral Tree of Life, 1 unit = 72, 60 & 132)

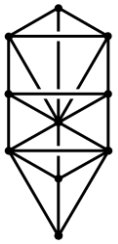
$$1330 = 1^2 \quad 3^2 \quad 5^2 \quad 7^2 \quad 9^2 \quad 11^2 \quad 13^2 \quad 15^2 \quad 17^2 \quad 19^2$$

Number of geometrical elements surrounding axes of two polyhedra = 10×132 = 1320.
Each axis has a centre, two "poles" and two sides of internal triangles.
Total number of geometrical elements = 10 + 1320 = 1330.



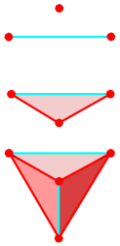
Nolan's Cross

Outer Tree of Life



22 sides of 16 triangles

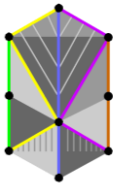
Trunk of the outer Tree of Life



(4+6=10) sides

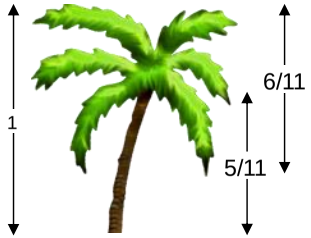
10/22 = 5/11

Branches of the outer Tree of Life



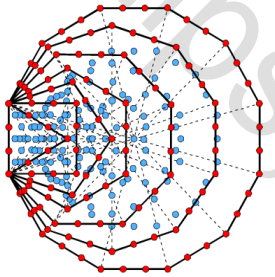
(6+6=12) sides

12/22 = 6/11



Proportions of the trunk & branches

120● → 120 faces of the disdyakis triacontahedron
144● → 144 faces of the 144 Polyhedron
264●&● → 264 faces of the Polyhedral Tree of Life



Inner Tree of Life

	Trunk	Branches
Outer Tree of Life:	10/22 = 5/11	12/22 = 6/11
Inner Tree of Life:	120/264 = 5/11	144/264 = 6/11
Polyhedral Tree of Life:	60/132 = 5/11	72/132 = 6/11
Nolan's Cross:	720/1584 = 5/11	864/1584 = 6/11

Fig. 73

37. Nolan's Cross as a representation of the "Polyhedral Tree of Life"

(For more details about the Polyhedral Tree of Life, see the section Sacred geometry/Polyhedral Tree of Life)

We have seen that the arms of Nolan's Cross represent the trunk of the outer Tree of Life with 10 sides of its five triangles and its vertical line represents the branches with 12 sides of its 11 triangles. We also have seen that the counterpart of this 5:6 proportion in the inner Tree of Life is the 120 yods lining the sides of its seven enfolded polygons and the 144 yods inside them, where 120/144 = 5/6. Does the Tree of Life have a polyhedral form that exhibits this ratio and whose geometrical composition conforms to the lengths marked out by the Cones of Nolan's Cross? Many years ago (long before he had even heard about the cross), the author's research uncovered what he now calls the "Polyhedral Tree of Life." Let us see whether it has the necessary properties.

The polyhedral version of the outer and inner Trees of Life consists of two polyhedra (Fig. 73). One (the so-called "144 Polyhedron") has 74 vertices, 216 edges & 144 triangular faces. The other (the disdyakis triacontahedron) is the most complex of the 13 types of Catalan solids, having 62 vertices, 180 edges & 120 triangular faces. When one of them is inside the other and shares its centre, the faces and internal triangles formed by their edges have (1+74+62=137) corners. Here, shaping the Polyhedral Tree of Life, is the mysterious number 137 that determines approximately the reciprocal of the fine-structure constant $\alpha = e^2/\hbar c \approx 1/137$ at the heart of atomic physics, whose magnitude physicists have yet to explain. Notice that the numbers of vertices surrounding an axis passing through two diametrically opposite vertices are 72 for the 144 Polyhedron and 60 for the disdyakis triacontahedron and that, for each polyhedron, the vertices:edges:faces proportion is 1:3:2. Notice, further, that the ratio 60/72 = 5/6, which is the ratio of the numbers of sides of triangles in the trunk and branches of the outer Tree. It means that every type of geometrical element — whether just one or in combination — that belongs to either polyhedron is in the proportion of the lengths of the arms and vertical length of Nolan's Cross. Finally, notice that the number (120) of faces of the disdyakis triacontahedron is the number of yods lining the perimeter of the seven enfolded polygons of the inner Tree of Life and that the number (144) of faces of the 144 Polyhedron is the number of yods inside them. Their ratio 120/144 = 5/6 means that the "trunk" of the Polyhedral Tree of Life is the disdyakis triacontahedron; it corresponds to the arms of the cross. Its branches are the 144 Polyhedron, which corresponds to the vertical line marked by Cones A, D & E.

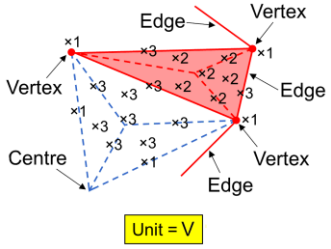


Fig. 74. Number weights of corners, sides & triangles in a polyhedron with (2+V) vertices, 3V edges & 2V triangular faces.

Shown in Fig. 74 are the number weights that can be assigned to each type of geometrical element in the faces and internal triangles when regarded as Type A triangles. Multiplying them by either 60, 72 or their sum 132 gives their total number surrounding the axes of, respectively, the disdyakis triacontahedron, the 144 Polyhedron and the Polyhedral Tree of Life. Shown below are the number weights when all faces and internal triangles are either simple triangles or Type A triangles:

Number weights for a polyhedron with (2+V) vertices, 3V edges & 2V triangular faces

(C = number of vertices/corners, S = number of edges/sides, T = number of triangles — expressed as weights).

	Triangle				Type A triangle			
	C	**S**	**T**	**Total = C + S + T**	**C**	**S**	**T**	**Total = C + S + T**
Exterior	**1**	**3**	**2**	**6**	**1** + **2** = **3**	**3** + **2**×3 = **9**	**2**×3 = **6**	**18**
Interior	**0**	**1**	**3**	**4**	**3**	**1** +**3**×3 = **10**	**3**×3 = **9**	**22**
Total	**1**	**4**	**5**	**10**	**6**	**19**	**15**	**40**

(Bold numbers are weights)

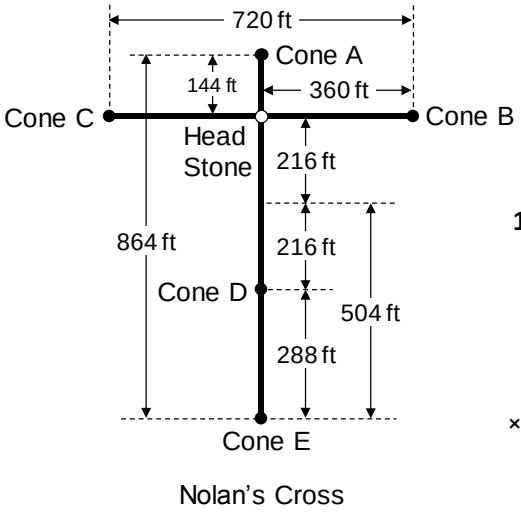
In the first case, the two polyhedra have (10×132=1320) geometrical elements surrounding their axes, each of which consists of two "poles," their centres and two straight lines, i.e., five geometrical elements. In total, the Polyhedral Tree of Life consists of 1330 geometrical elements, where 1330 is the sum of the squares of the first 10 odd integers:

$$1330 = 1^2 + 3^2 + 5^2 + 7^2 + 9^2 + 11^2 + 13^2 + 15^2 + 17^2 + 19^2.$$

This demonstrates the mathematical *beauty* of the geometry of the Polyhedral Tree of Life. The disdyakis triacontahedron has (10×60=600) geometrical elements surrounding its axis and the 144 Polyhedron has (10×72=720) such geometrical elements, their ratio being 5/6, as with the trunk & branches of the outer Tree of Life.

When the 120 faces of the disdyakis triacontahedron are Type A triangles, the number of their vertices/corners & edges = (**3**+**3**=**6**)×60 = 360, and the number of their sides = **2**×3×60 = 360; this compares with the 360 ft length of each arm of Nolan's Cross. The number of vertices & edges in the 144 faces of the 144 Polyhedron = (**1**+**3**=**4**)×72 = 288, comparing with the distance of 288 ft between Cones D and E. The number of corners & sides = (**2** + **2**×3)×72 = 8×72 = 576, comparing with the 576 ft between Cone A and Cone D. The (**2**×72=144) corners of sectors in faces denotes the distance between Cone A and the Head Stone; the number (**2**×3×72=432) of sides of sectors denotes the distance between the Head Stone and Cone D. The distance between Cone A and Cone E = 12×72 = 864 ft. It corresponds to the weight (**3**+**9**=**12**) for corners & sides in faces multiplied by the 72 vertices surrounding the axis of the 144 Polyhedron. The distance of (10×72=720) ft between Cone B and Cone C corresponds to the weight **12** for corners & sides in faces multiplied by the 60 vertices surrounding the axis of the disdyakis triacontahedron. *The lengths of the vertical and horizontal lines in Nolan's Cross measure, respectively, the numbers of corners & sides of sectors of faces of the 144 Polyhedron and disdyakis triacontahedron that make up the Polyhedral Tree of Life*.

Length of Nolan's Cross = 1584 ft.
Number of points & lines in the faces of the Polyhedral Tree of Life = **12** →12(72+60) = 12×72 + 12×60 = 864 + 720 = 1584.

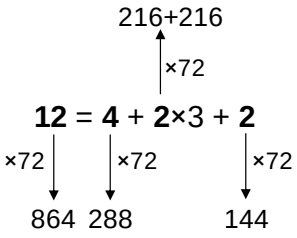


Nolan's Cross

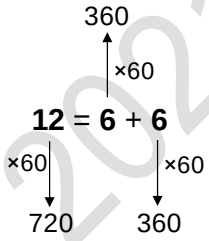
Number weights for the faces of a polyhedron with (2+V) vertices, 3V edges & 2V triangular faces

Number of vertices & edges in faces = **1** + **3** = **4**;
Number of corners & sides in faces = **2** + **2**×3 = **8**;
Total = **4** + **8** = **12**;
Number of vertices, corners & edges in faces = **3** + **3** = **6**;
Number of sides in faces = **2**×3 = **6**;
Total = **6** + **6** = **12;**

144 Polyhedron (V = 72)

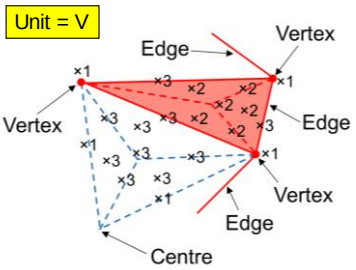


Disdyakis triacontahedron (V = 60)



The distances in feet marked out in the vertical and horizontal sections of Nolan's Cross are the numbers of vertices, corners, edges & sides in the Type A faces of, respectively, the 144 Polyhedron and the disdyakis triacontahedron that make up the Polyhedral Tree of Life.

Figure 75



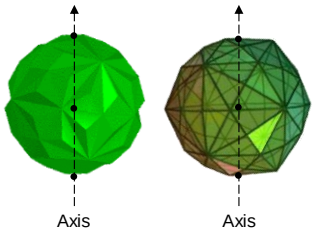
Number weights for a polyhedron with (2+V) vertices, 3V edges & 2V triangular faces

(C = number of vertices/corners surrounding axis, S = number of edges/sides, T = number of triangles — all expressed as weights).

	Triangle				Type A triangle			
	C	S	T	Total = C + S + T	C	S	T	Total = C + S + T
Exterior	**1**	**3**	**2**	**6**	**1** + **2** = **3**	**3** + **2**×3 = **9**	**2**×3 = **6**	**18**
Interior	**0**	**1**	**3**	**4**	**3**	**1** +**3**×3 = **10**	**3**×3 = **9**	**22**
Total	**1**	**4**	**5**	**10**	**6**	**19**	**15**	**40**

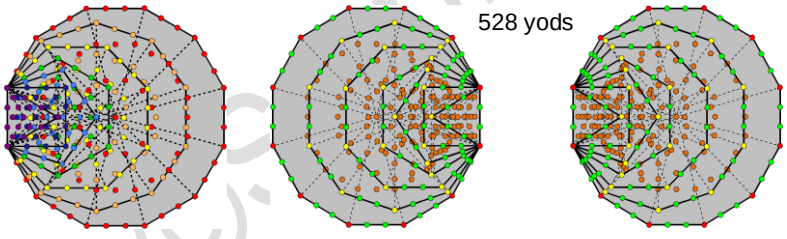
(Bold numbers are weights)

Polyhedral Tree of Life



Polyhedral Tree of Life	**144 Polyhedron**	**Disdyakis triacontahedron**
4 + 132 vertices	2 + 72 vertices	2 + 60 vertices
396 edges	216 edges	180 edges
264 faces	144 faces	120 faces

1 + **3** = **4**
2 + **2**×3 = **8**



● = ● = ● = ● = 10

Half of inner Tree of Life

Left half		
Boundary	12●	→ 120
	24●	→ 240
	84●	→ 840
Internal	144●	→ 1440
Total	264 yods	→ 2640

Right half		
Boundary	12●	→ 120
	24●	→ 240
	84●	→ 840
Internal	144●	→ 1440
Total	264 yods	→ 2640

Total = 5280

	Upper Half	**Lower Half**
Disdyakis triacontahedron	**4**×30 = 120 vertices & edges.	**4**×30 = 120 vertices & edges.
	8×30 = 240 corners & sides in faces.	**8**×30 = 240 corners & sides in faces.
	28×30 = 840 geometrical elements.	**28**×30 = 840 geometrical elements.
144 Polyhedron	**40**×36 = 1440 geometrical elements.	**40**×36 = 1440 geometrical elements.
Polyhedral Tree of Life	**40**×66= 2640 geometrical elements.	**40**×66 = 2640 geometrical elements.

Total = 5280 geometrical elements

Figure 76

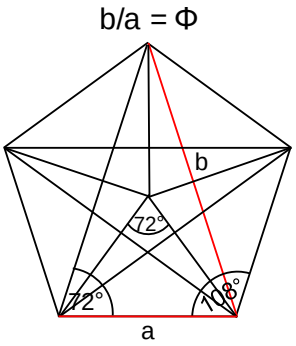
Figure 75 displays these correspondences in detail. The weight **12** measuring the number of points & lines in the faces of a polyhedron with (2+V) vertices, 3V edges & 2V triangular faces generates (12×72=864) points & lines in the faces of the 144 Polyhedron with 72 vertices surrounding its axis; this corresponds to the distance of 864 ft between Cone A and Cone E. The number of vertices, corners and edges in the faces = **3** + **3** = **6**, whilst the number of sides of sectors = **2**×3 = **6**, so that the total number of points & lines in the faces = **6** + **6** = **12**. For the disdyakis triacontahedron, the number = **12**×60 = 720 = (6+6)×60 = 360 + 360. The two arms are of equal length (360 ft) because they symbolise the 360 vertices, corners & edges and the 360 sides of sectors of the 120 faces of the disdyakis triacontahedron. The distances marked out by the cones and Head Stone measure the numbers of various combinations of points and lines in the 144 Polyhedron, which discussion in previous pages established as being the "branches of the Polyhedral Tree of Life. The Head Stone divides the arms of the cross *equally* because the number of sides of sectors in its faces is equal to the number of vertices, corners & edges. The arms must be 5/6 of the vertical length of the cross because the number of vertices surrounding the axis of the disdyakis triacontahedron is 60, which is 5/6 of the corresponding number 72 for the 144 Polyhedron. Each foot of length corresponds to a point or line in the 264 Type A faces of the Polyhedral Tree of Life. When faces are simple triangles, the weight for vertices & edges is (**1**+**3**=**4**). This means that the "basic" Polyhedral Tree of Life has (**4**×132=528) points & lines in its faces. When the faces are Type A, the weight for these increases by 8, so that there are 528 points & lines added in each half of the pair of polyhedra, making a total of 1584. We see that the geometry of the faces of the Polyhedral Tree of Life divides up into three distinct sets of 528 points & lines, just as in previous pages we saw that Nolan's Cross can be regarded as three sections of 504 ft (168 yards). Complete isomorphism exists between the two structures because they are but different representations of the archetypal Whole.

It must not be thought that Nolan's Cross expresses through distances between cones the *complete* structure of the Polyhedral Tree of Life. It portrays just the points and lines needed to construct the 264 faces of its two polyhedra. It can be viewed as a *minimal* representation of the archetypal geometry. However, the number 1584 expressing its length in feet appears also in the interior of the 144 Polyhedron. There are **3** corners, **10** sides and **9** triangles, i.e., (**3**+**9**=**12**) corners & triangles, giving a total weight of **22** for internal geometrical elements. The 144 Polyhedron with 72 vertices surrounding its axis has (**22**×72=1584) geometrical elements surrounding it that are made up of (12×72=864) points & triangles and (10×72=720) lines. This corresponds to the 864 ft length of the vertical section and the 720 ft length of the horizontal section of Nolan's Cross. The isomorphism exists because the 144 Polyhedron has the same number of vertices surrounding its axis as the number of feet (72) in the unit of length that turns the lengths of various sections of the cross into integers. In fact, these integers are, simply, the number weights for different combinations of points and lines making up the faces of the disdyakis triacontahedron and 144 Polyhedron,

As convincing evidence that these two polyhedra really are the polyhedral counterpart of the inner Tree of Life, Figure 76 displays the isomorphism between their geometrical composition and the yod population of the seven enfolded Type A polygons. The 120 yods on the boundaries of each set of seven enfolded, regular polygons consist of their 36 corners and 42 pairs of hexagonal yods. The corners comprise the 12 corners of the dodecagon (the last of these polygons) and the 24 corners of the first six enfolded polygons. Inside the boundaries of the seven polygons are 144 yods. Weighted with the number 10, they naturally generate the numbers 120, 240, 840 & 1440. Given that the weight for vertices & edges = **1** + **3** = **4** and that the weight for corners & sides of triangles in faces = **2** + **2**×3 = **8**, the weight for all corners & sides in faces = **4** + **8** = **12**, so that the weight for all triangles and internal geometrical elements = **40** − **12** = **28**. Surrounding the axis of the disdyakis triacontahedron are 60 vertices (30 in each half). There are (**4**×30=120) vertices & edge in each half of the polyhedron; they correspond to the number 120 generated by the 12 corners of the dodecagon in each set of seven polygons. There are (**8**×30=240) corners & sides in the 60 faces in each half of the polyhedron; they correspond to the number 240 generated by the 24 corners of the first six polygons. There are (**28**×30=840) triangles in faces and geometrical elements in the interior of each half; they correspond to the number 840 generated by the 84 hexagonal yods on the boundaries of each set of seven enfolded polygons. Finally, each half of the 144 Polyhedron has 36 vertices surrounding its axis, so that it has (**40**×36=1440) geometrical elements; this compares with the number 1440 generated by the 144 yods weighted with the number 10 inside each set of seven enfolded polygons. Each half of the Polyhedral Tree of Life contains (120+240+840+1440=2640) geometrical elements surrounding the axes of the two polyhedra, and this is the number generated when the number 10 is assigned to each of the 264 yods making up each half of the inner Tree of Life. How appropriate it is that the 10 dots of the Pythagorean tetractys should be called "yods," given that Kabbalistic gematria assigns the number 10 to the Hebrew letter yod! Only two polyhedra with the same scaling ratio of 1:3:2 and with 132 vertices surrounding their axes would embody both the number 1330 discussed in #37 and the number 5280. Only a polyhedron with 60 such vertices would have (**12**×60=720=72×10) corners & sides of sectors in faces and (**28**×60=1680=168×10) triangles & internal geometrical elements — the two numbers that match the 72:168 division of corners and hexagonal yods on the boundaries of the two separate sets of seven enfolded polygons. The two polyhedra that comprise the Polyhedral Tree of Life — the 144 Polyhedron and the disdyakis triacontahedron — are unique in having geometrical compositions that are isomorphic to its polygonal counterpart.

1 unit = 72 ft

Fig. 77



2bcos72° = a
cos72° = a/2b = 1/2Φ
= ½(Φ−1) = ¼(√5−1).

Fig. 78

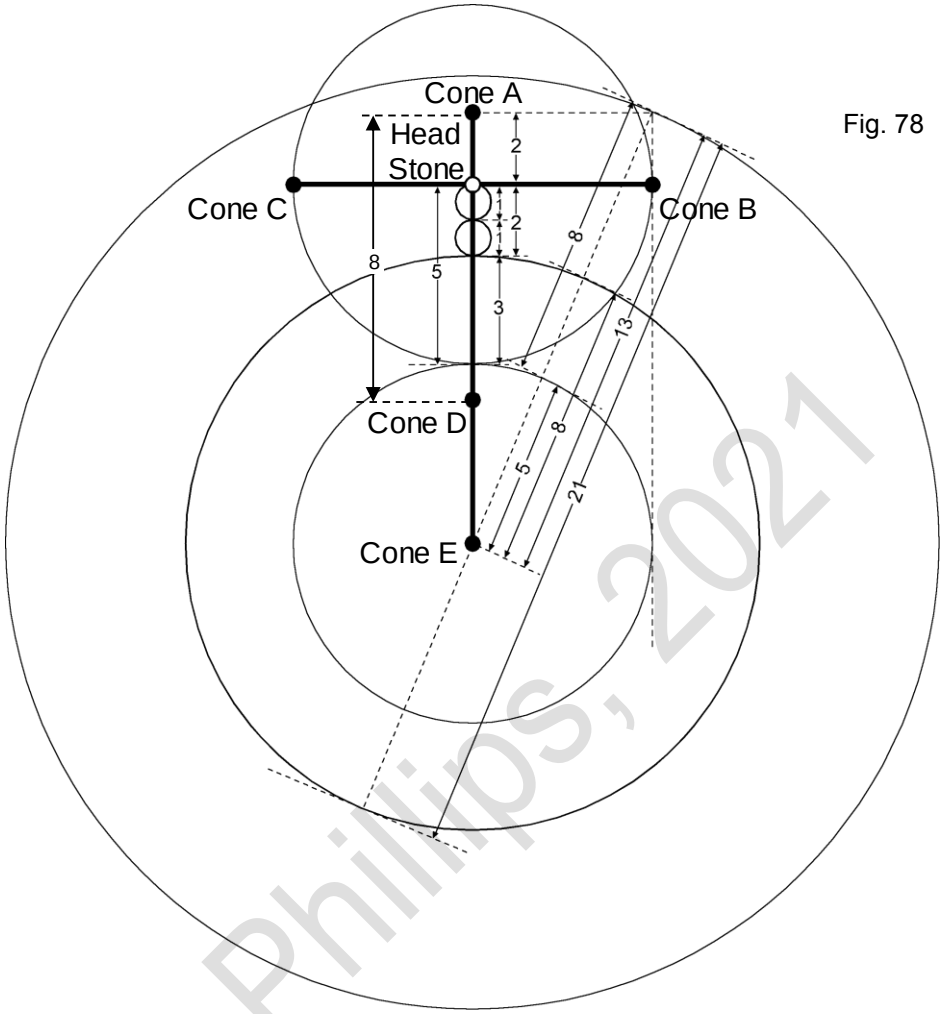
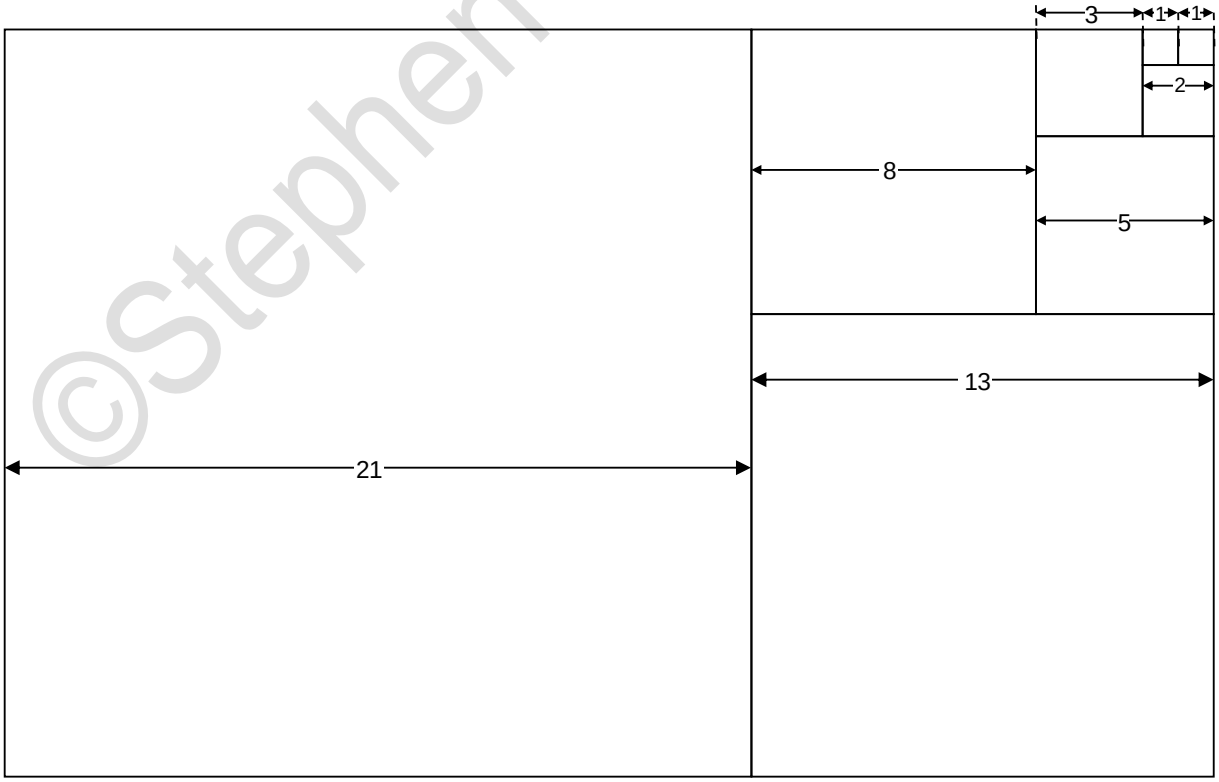


Fig. 79



39. Fibonacci numbers in the geometry of Nolan's Cross

The unit of distance used in the arrangement of the stone boulders in Nolan's Cross that turns horizontal and vertical distances between them into integers is 72 ft. The number 72 has the well-known Kabbalistic significance of being the number of "Names of God" (this need not be described here). It is also the gematria number value of Chesed (חסד), the first of the seven Sephiroth of Construction. As the angle subtended at the centre of a pentagon by each of its sides (Fig. 77), it is related to the Golden Ratio Φ because this is the ratio b/a of the length b of any diagonal to the length a of any side, and a = 2bcos72°, so that cos72° = a/2b = 1/2Φ = ½(Φ−1) = (√5–1)/4. In view of this, it may not be surprising that the first few members of the infinite Fibonacci sequence:

$$0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, \ldots,$$

where the nth number $a_n = a_{n-1} + a_{n-2}$ ($n>2$; $a_0 = 0$) appear in the distances (expressed in units of 72 ft) between various pairs of cones, as now discussed.

Here are examples of Fibonacci numbers in Nolan's Cross (see Fig. 78):

1: the core segment 7 units from Cone E. It is one unit long;
2. the distance between Cone A and the headstone is 2 units;
3. a circle of radius 2 units centred on the Head Stone passes through Cone A and divides into sections of 2 and 3 units each arm of the cross that is 5 units long;
4. The distance between Cone A and Cone D is 8 units;
5. If a straight line parallel to the vertical Cone A-Cone E line is drawn through Cone B, it intersects the line drawn through Cone A parallel to the arms of the cross at a point that is 13 units from Cone E. This is because one side of the right-angled triangle that is formed is 5 units long, a second side connecting Cone A and Cone E is 12 units long and, in accordance with Pythagoras' theorem,

$$12^2 + 5^2 = 13^2.$$

Figure 78 shows concentric circles of radius 5, 8 & 13 units with Cone E as their centre.
6. If the hypotenuse of this right-angled triangle is extended, it intercepts the circle of radius 8 units at a point that is (8+13=21) units from the fourth corner of the rectangle with Cone A, Cone B & the Head Stone at its other corners. The number 21 is a global parameter of the cross because it is the length of the three sections, each 7 units long, that surround the core segment, the total length of the cross being 22 units.

The Fibonacci numbers 3, 5 & 13 are the only Fibonacci numbers that are also *twin primes*, that is, pairs of prime numbers that differ by 2, namely, (3, 5) and (11, 13).

The Fibonacci numbers are the lengths of sides of successive squares that are generated from rectangles that started from the joining together of two squares of unit length (Fig. 79). As the lengths of successive rectangles increase, the ratio of their sides converges towards the limiting value of Φ. This is because it can be shown that $a_{n+1}/a_n \rightarrow \Phi$ as $n\rightarrow\infty$. The rectangles approach the shape of the Golden Rectangle. The lengths of the sides of the rectangle with Cones A & D at two corners and the vertical line through Cone B as a side are 5 and 8. Their ratio is 1.6, which is only 1.1% from the value 1.6180… of Φ. It is therefore a good approximation to the Golden Rectangle. However, it would be wrong to think that the designers of Nolan's Cross intended this (see remarks below).

Figure 80 indicates how different sections of Nolan's Cross have lengths measured in units of 72 ft by the first *eight* Fibonacci numbers. The colour of a number is that of the length that it measures.

The author has shown that Fibonacci numbers manifest in the sacred geometries of the Tree of Life (both outer and inner), as well as in the Sri Yantra (see at his website Article 50 (Parts 1 & 2): The Golden Ratio, Fibonacci & Lucas numbers in sacred geometries). As the cross is a geometrical representation of some of the parameters defining holistic systems, as encoded in the blueprints of sacred geometries, it is not surprising that they should be encountered here; mathematicians, artists and philosophers have long regarded the Golden Ratio as an ideal mark of divine handiwork. But does the presence of Fibonacci numbers — either overt or implicit — in the geometry of Nolan's Cross have any significance in the wider context of the Money Pit of Oak Island? If this property had been added on purpose in order to provide a cryptic clue to the location of buried treasure, the question would be easy to answer, for there would be no reason to turn measurements into Fibonacci numbers except to guide a mathematically literate treasure hunter. However, the author would argue that they *must* be present in any representation of the divine paradigm, for that is what his analysis of sacred geometries reveals. It means that no significance vis-à-vis potential treasure clues can be ascribed to their presence in Nolan's Cross.

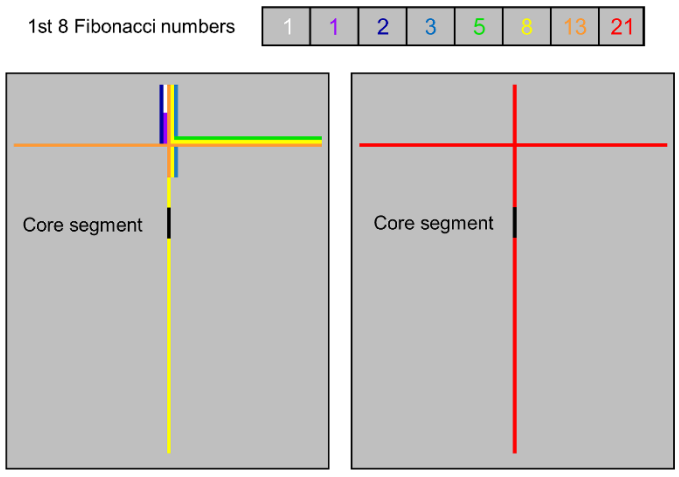


Fig. 80. Sections of Nolan's Cross have lengths that are Fibonacci numbers because it represents holistic systems found in Nature.

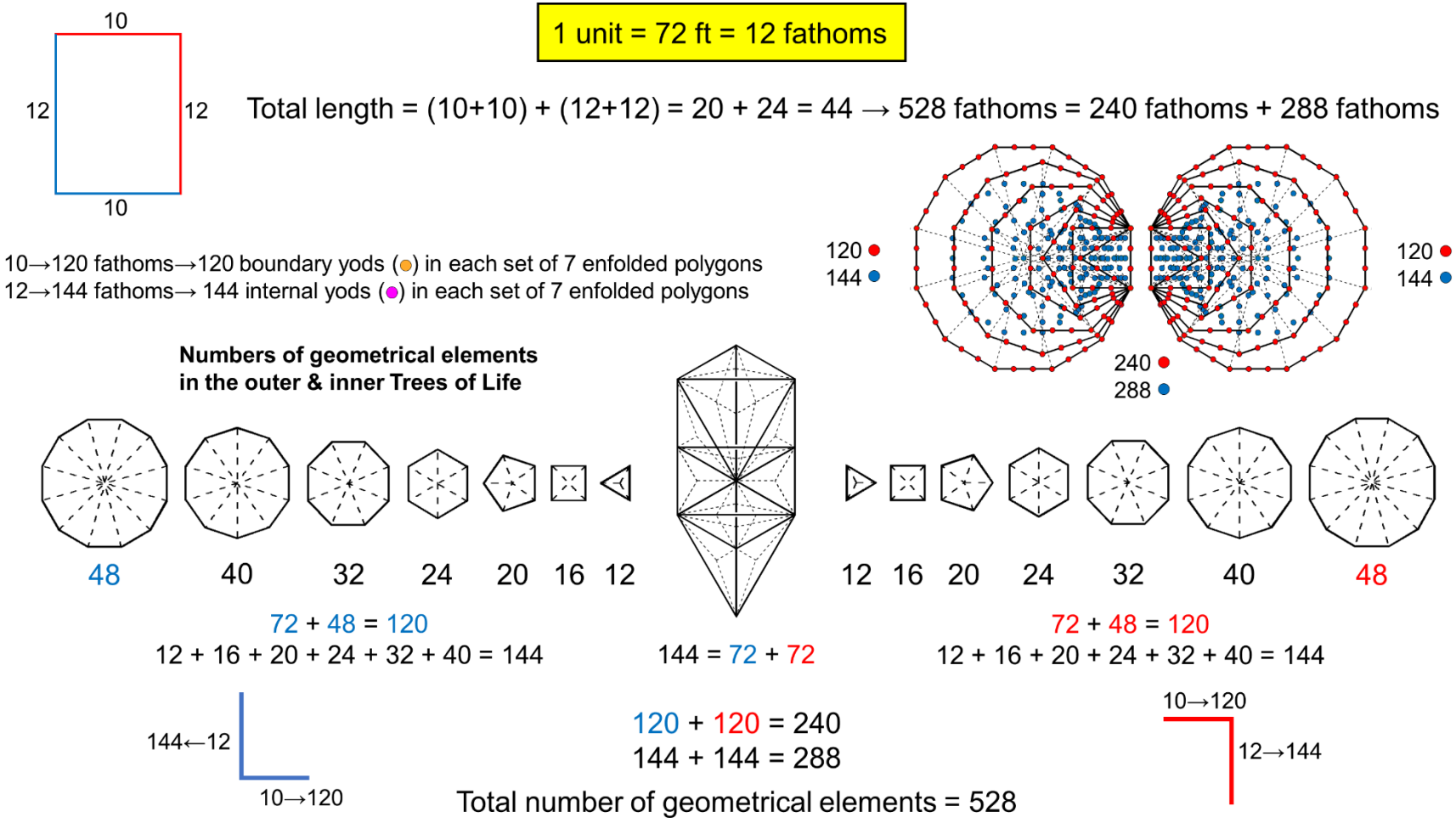


Figure 81. The architecture of Nolan's Cross is isomorphic to the outer & inner Tree of Life.

40. Tree of Life parameters in the Nolan's Cross architecture

The vertical and horizontal lines of the cross are enclosed in a rectangle that is (10+12+10+12=44) units in total length (Fig. 81). As one unit is **72** ft, or 12 fathoms, this is (12×44=528) fathoms. Each pair of sides (red & blue) is 264 fathoms in length. Compare this with the two sets of seven enfolded Type A polygons that are the two halves of the inner Tree of Life. Each set contains 264 yods. Every yod corresponds to one fathom of length. Each horizontal side of the rectangle is 10 units (120 fathoms) long. This compares with the 120 red yods lining the 42 sides of each set of enfolded polygons. Each vertical side is 12 units (144 fathoms) long, comparing with the 144 blue yods inside the boundaries of the polygons in each set. The division:

$$528 = 240 + 288$$

between the lengths of the horizontal and vertices sides of the rectangle corresponds to the distinction between the shape-forming boundaries of the polygons making up the inner Tree and their interiors, i.e., what previously has been shown to be analogous to the trunk and branches of the outer Tree because the proportion 120:144 = 5:6 is that of the numbers of straight lines in these two sections: 10:12 = 5:6.

Let us next consider each half of the inner Tree of Life (now regarded as *separate* polygons) and place the outer Tree of Life between each half. The number of geometrical elements (i.e., points, lines & triangles) that surround the centre of the Type A n-gon = 4n. The Type A dodecagon has **48** such geometrical elements and the first six Type polygons with **36** corners have 144 such geometrical elements, making a total of 192. There are (192+192=384) geometrical elements surrounding the centres of all 14 Type A polygons. The outer Tree of Life consist of 16 triangles with 10 corners and 22 sides. When each one is Type A, it has three sectors with three internal sides meeting at one corner (seven geometrical elements). The total number of geometrical elements in the outer Tree of Life = 10 + 22 + 16×7 = 144. The number of geometrical elements in the separate outer and inner Trees of Life = 144 + 384 = 528. This is both the yod population of the separate halves of the inner Tree and the length in fathoms of the rectangle enclosing Nolan's Cross. This correspondence is remarkable. It shows that each fathom of length in the geometry of the cross's architecture corresponds not only to a yod in each half of the inner Tree but also to a geometrical element in the outer & inner Trees. Moreover, the outer Tree can be divided into two *mathematical* halves, each with **72** geometrical elements. If we associate each half with each half of the inner Tree, there are (**72**+**48**=120) geometrical elements in each half and its associated dodecagon, leaving 144 geometrical elements in each set of the first six polygons. Hence, there are (120+144=264) geometrical elements associated with each combined half. Each set of 264 elements corresponds to each pair of adjacent sides of the rectangle (either the two red sides or the two blue sides).

The fact that a fathom is two yards is what enables the sacred number 528 to appear in both the cross as the number of yards in its length and the perimeter of the rectangle as the number of fathoms in its length. The length of the rectangle is twice that of the cross.

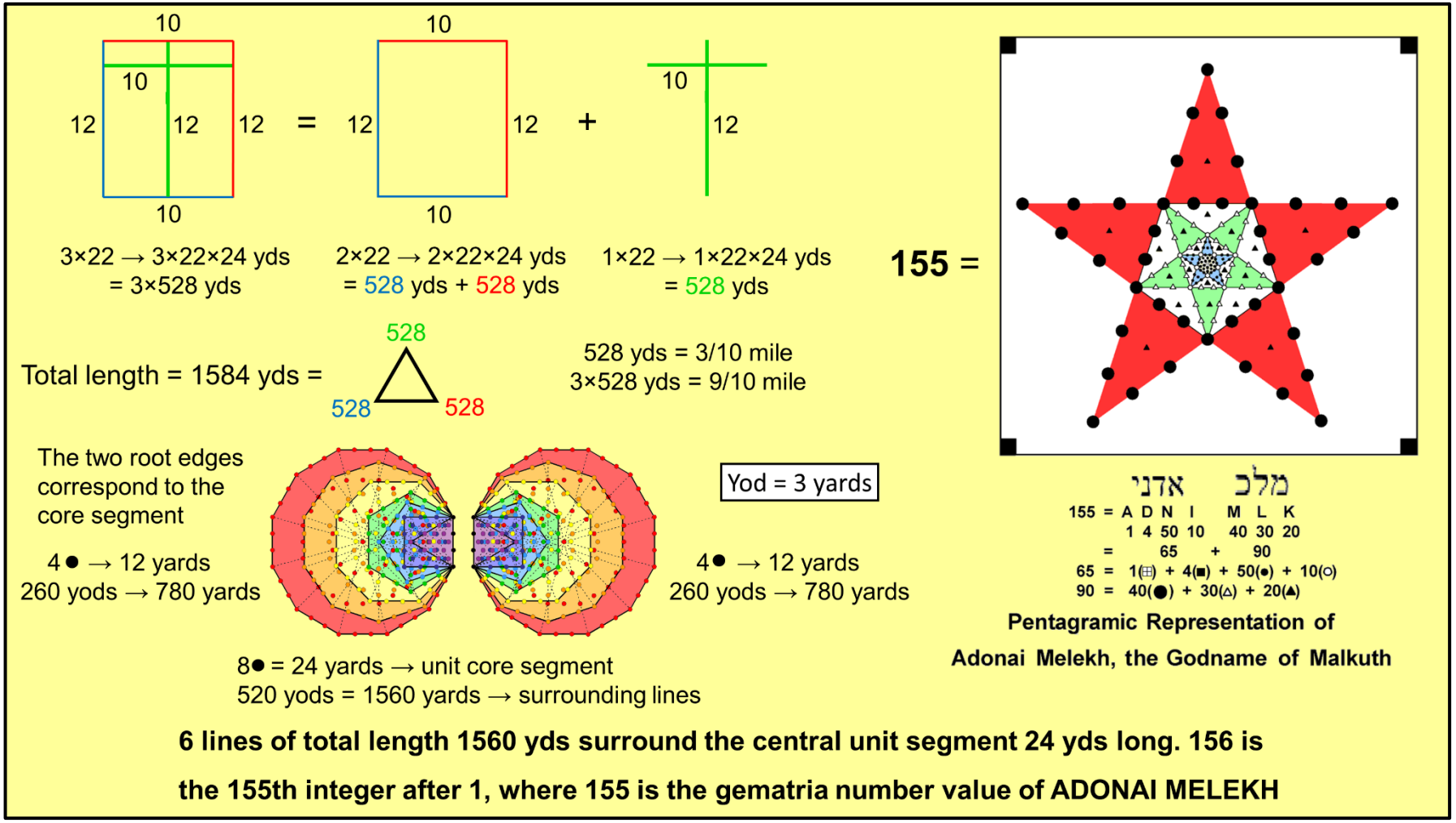


Figure 82. The Divine Name ADONAI MELEKH prescribes the total length of Nolan's Cross and its enclosing rectangle.

41. The Divine Name ADONAI MELEKH prescribes the Nolan's Cross architecture

The length of Nolan's Cross is 22 units. As one unit is 24 yards, this is 528 yards. The length of its enclosing rectangle is 44 units, which is 2×528 yards. Hence, the length of the cross and the rectangle is 3×528 (=1584) yards (Fig. 82). 528 yards is 3/10 mile (1/10 of a league), so that the total length is 9/10 mile. The core segment is one unit long (24 yds), so that it is surrounded by lines of length **65** units, where **65** is the number value of ADONAI, the Divine Name associated with Malkuth, the tenth Sephirah. This length is (1584-24=1560=156×10) yards, where 156 is the **155**th integer after 1 and **155** is the number value of ADONAI MELKEH, the *complete* Godname of Malkuth. The Godname that is associated with the Sephirah signifying the material form of any system that conforms to the Tree of Life blueprint has a number value that measures the very length of the lines needed to create the *form* of Nolan's Cross and its enclosing rectangle. The matching between the metaphysical meaning of this Sephirah and the magnitude of this length is very remarkable evidence of the holistic nature of the architecture of Nolan's Cross.

The number values of the Hebrew letters in ADONAI MELEKH are the numbers of various classes of yods (denoted by circles, squares, triangles, etc) that make up three nested pentagrams with a pentagon at their core.

Just as the number **65** is the sum of the first 10 integers after 1:

$$\begin{array}{rc} & 2 \\ & 3 \quad 4 \\ \mathbf{65} = & 5 \quad 6 \quad 7 \\ & 8 \quad 9 \quad 10 \quad 11, \end{array}$$

so, too, the number **155** is the sum of the first 10 integers after 10:

$$\begin{array}{rc} & 11 \\ & 12 \quad 13 \\ \mathbf{155} = & 14 \quad \mathbf{15} \quad 16 \\ & 17 \quad 18 \quad 19 \quad 20. \end{array}$$

This demonstrates the power of the number 10, symbolised by the tetractys, to express the values of Godname numbers.

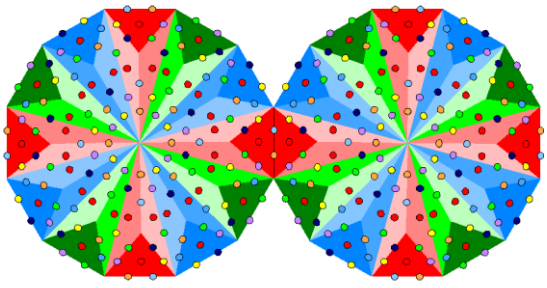
It is remarkable that the number 156 is the sum of the gematria number values of the *four* types of combinations of the letters Y, H and V in the Godname YHVH of Chokmah:

Y = 10, H = 5, V = 6

1.	Y + H + V	= **21**
2.	YH + YV + HH + HV	= 52
3.	YHV + YHH + HVH	= 57
4.	YHVH	= **26**
	TOTAL	= 156

The fact that it determines the *total* length of all the lines in the architecture of Nolan's Cross illustrates the creative potency of this Godname. It is further illustrated by the following fact. The number of SLs in n overlapping Trees of Life = 6n + 4. Every **26** Trees of Life have (**26**×6=156) SLs.

The number of hexagonal yods in the Type B n-gon = 13n. The Type B dodecagon (n=12) has 156 hexagonal yods (Fig. 83). If the number 10 is assigned to these yods, the number 1560 is generated as



156 hexagonal yods 156 hexagonal yods

Figure 83. The Type B dodecagon has 156 hexagonal yods. Associated with each dodecagon when it is part of the inner Tree of Life are **155** yods, where **155** is the number value of ADONAI MELEKH, the Godname of Malkuth.

their sum and this is the length in yards of the lines in Nolan's Cross and its enclosing rectangle that surround the core segment. The same number appears here because both the dodecagon and this geometrical object are holistic systems that embody the same holistic parameters. Associating one hexagonal yod on the shared root edge with each dodecagon, there are **155** hexagonal yods associated with each polygon. The second hexagonal yod in the root edge is analogous to the core segment one unit in length, whilst the **155** hexagonal yods shaping each dodecagon are analogous to the **155** units of length in all the lines forming Nolan's cross and its enclosing rectangle.

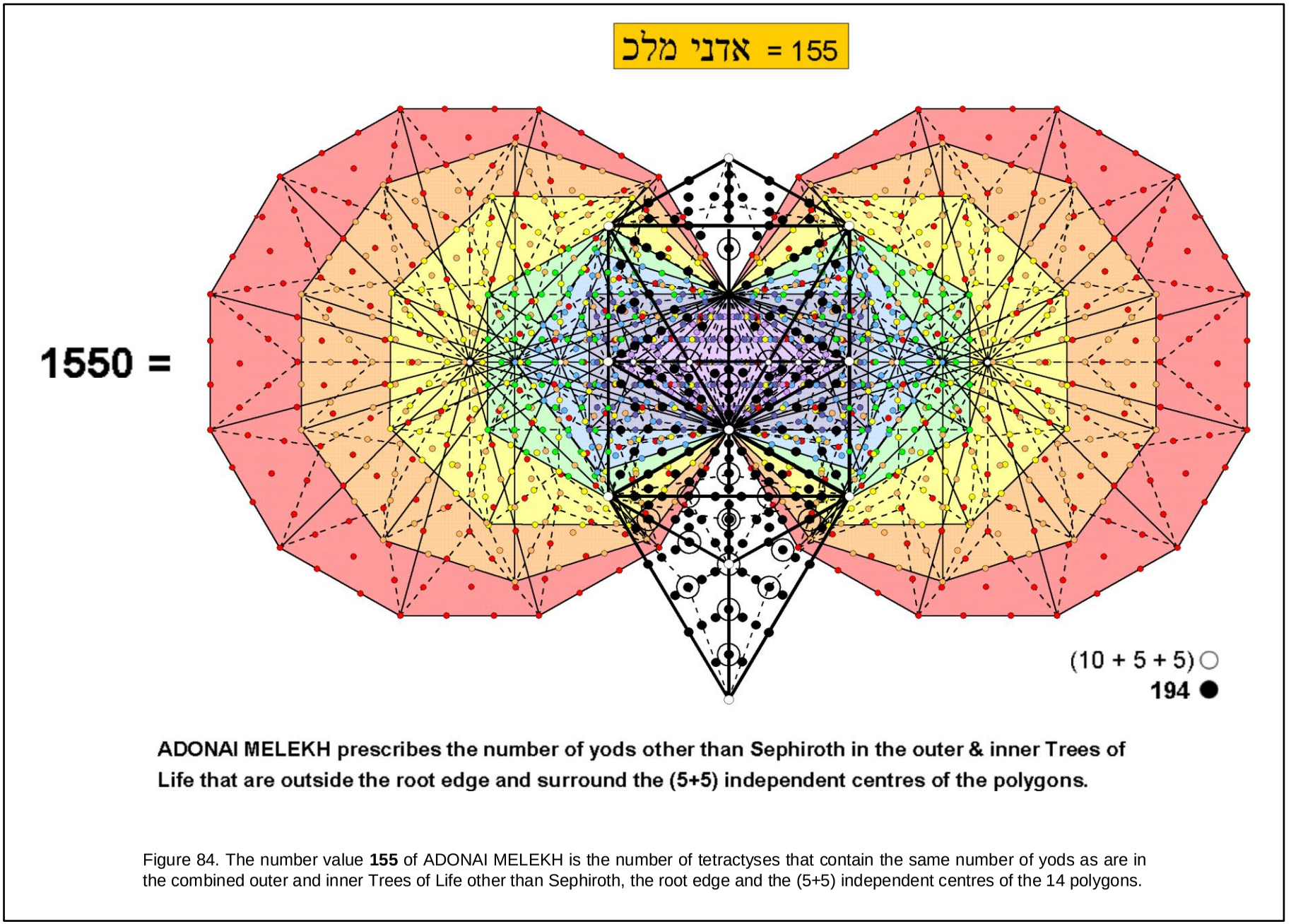


Figure 84. The number value **155** of ADONAI MELEKH is the number of tetractyses that contain the same number of yods as are in the combined outer and inner Trees of Life other than Sephiroth, the root edge and the (5+5) independent centres of the 14 polygons.

The number 156 is arithmetically linked to the dodecagon because the latter has 12 corners and 156 is the sum of the first 12 even integers:

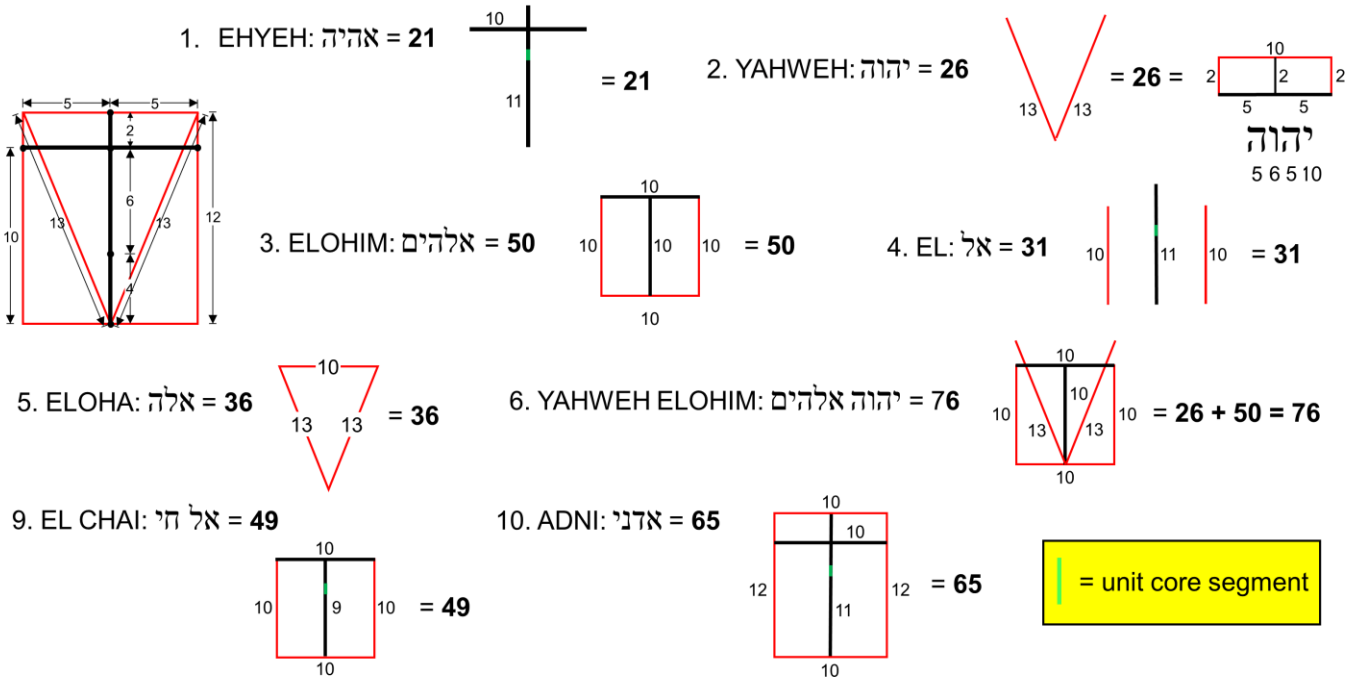
$$2 + 4 + 6 + 8 + 10 + 12 + 14 + 16 + 18 + 20 + 22 + 24 = 156.$$

The two dodecagons sharing one side that make up the inner Tree of Life have 22 corners. The 10 corners outside the root edge that belong to one of = them correspond to the 10 units of length between the Head Stone and Cone E, whilst the 12 corners of the second dodecagon correspond to the 12 units of length between Cone A and the Head Stone and between Cone B and Cone C. The line joining Cone A and the Head Stone is two units long; it corresponds to the two endpoints of the root edge (the two corners shared by both dodecagons).

The calculation below indicates that there are 1550 yods in the combined outer & inner Trees of Life surrounding centres of polygons when triangles in the former are Type A and the polygons are Type B:

Outer Tree of Life	**Inner Tree of Life**
It has 16 triangles with 10 corners and 22 sides. Ten yods are inside each triangle. Number of yods = 10 + 22×2 + 16×10 = 214.	Each set of 7 enfolded polygons has 47 sectors with 41 corners and 88 sides. The (7+7) enfolded polygons have (47+47=94) sectors with (41+39=**80**) corners and (88+**87**=175) sides. Ten yods are inside each sector. Number of yods = **80** + 175×2 + 94×10 = 1370.
Combined outer & inner Trees of Life	
• Two pairs of hexagonal yods on the Pillar of Mercy of the outer Tree of Life and two pairs of hexagonal yods on its Pillar of Judgement coincide with hexagonal yods lining the internal vertical sides of the two hexagons of the inner Tree of Life when both Trees combine. The two hexagonal yods on the Path connecting Chesed and Geburah coincide with the centres of the two triangles that belong to the inner Tree of Life. • The number of yods in the outer Tree that are not Sephiroth and which coincide with yods of its inner form = 214 – 10 – 2 – 2 – 2 – 2 – 2 = **194**. This is the number value of *Tzadekh*, the Mundane Chakra of Chesed. • The number of yods in the combined Trees of Life = **194** + 1370 = 1564. • Four yods lie on the root edge. The number of yods outside the root edge = 1564 – 4 = 1560. • A corner of each pentagon coincides with the centre of its associated decagon. The centre of each hexagon coincides with a corner of each triangle. In each set of seven polygons two polygons have centres lying on the boundaries of polygons and five polygons do not have such centres. • The number of yods outside the root edge that surround (rather than contain) centres of polygons = 1560 – 5 – 5 = 1550 = **155**×10. They include the centres of the two hexagons and the two decagons. Excluding *all* centres but restoring the four Sephiroth unshared with the polygons leavers this total unchanged. It is therefore the number of yods in the combined Trees (including the 10 Sephiroth) that are outside the root edge and surround all 14 centres.	

(214+1370=1584) yods are needed to construct the *separate* outer & inner Trees of Life. This is the number of yards in Nolan's Cross and its enclosing rectangle. When they combine, 16 yods (seven yods on each pillar and the two hexagonal yods on the Path joining Chesed and Geburah) disappear, leaving 1568 yods (1564 yods outside the root edge). They include the centres of the two hexagons and the two decagons that are corners of, respectively, triangles and pentagons. Hence, (1564–4=1560) yods are outside the root edge and include (5+5=10) centres that are not also corners. They correspond to the 1560 yards in Nolan's Cross and the rectangle enclosing it. (1560–10=1550) yods are outside the root edge and not centres of polygons. The yods in **155** tetractyses are needed to construct the outer & inner forms of the Tree of Life.



The Godnames of the 10 Sephiroth prescribe parts of the geometry underlying Nolan's Cross

Figure 83. How some ancient Hebrew Divine Names prescribe the lengths of combinations of lines in Nolan's Cross.

42. The ancient Hebrew Godnames prescribe the Nolan Cross architecture

As Nolan's Cross is a representation of the holistic pattern of numbers found in sacred geometries, it should not be surprising that the Divine Names of the ten Sephiroth should prescribe its measurements in terms of their gematria number values. These prescriptions are listed below for most of the Sephiroth:

1. Kether: EHYEH = **21**.
The length of the two lines forming the cross is 22 units. Surrounding the unit core segment (the short, green line shown in Figure 83) are two lines with a length of **21** units.

2. Chokmah: YAHWEH = **26**.
The total length of the hypotenuses of the four right-angled triangles forming the enclosing rectangle with sides 5,10 & 13 units long is **26** units. This is also the length of the two 2×5 rectangles. The letter values of YHVH are Y = 10, H = 5, V = 6 & H = 5. The length of one horizontal side is 10, each of the two arms is 5 units long, and the length of the vertical sides of the two rectangles is (2+2+2=6).

3. Binah: ELOHIM = **50**.
The 10×10 square beneath the arms of the cross consists of its four sides and a vertical section of the cross. Their total length is (5×10=**50**) units.

4. Chesed: EL = **31**.
The three vertical lines have lengths of 10, 12 & 10 units, totalling 32 units. Surrounding the core are **31** units of vertical lines.

5. Geburah: ELOAH = **36**.
The straight line joining Cone E to either Cone B or Cone C is 13 units long because it is the hypotenuse of a right-angled triangle whose two other sides are 5 units and 12 units long, where

$$5^2 + 12^2 = 13^2.$$

The isosceles triangle with sides 10, 13 & 13 units long has a perimeter that is **36** units long.

6. Tiphareth: YAHWEH ELOHIM = **76**.
The length of the two inclined lines and the 10×10 square divided by the vertical section of the cross = **26** + **50** = **76** units.

7. Yesod: EL CHAI = **49**.
The two halves of the square have a length of **50** units. Surrounding the core is a length of **49** units.

8. Malkuth: ADONAI = **65**.
The length of Nolan's Cross and its enclosing rectangle is 66 units. Surrounding the core are **65** units of length (see previous page for discussion of the number value **155** of the complete Godname ADONAI MELEKH).

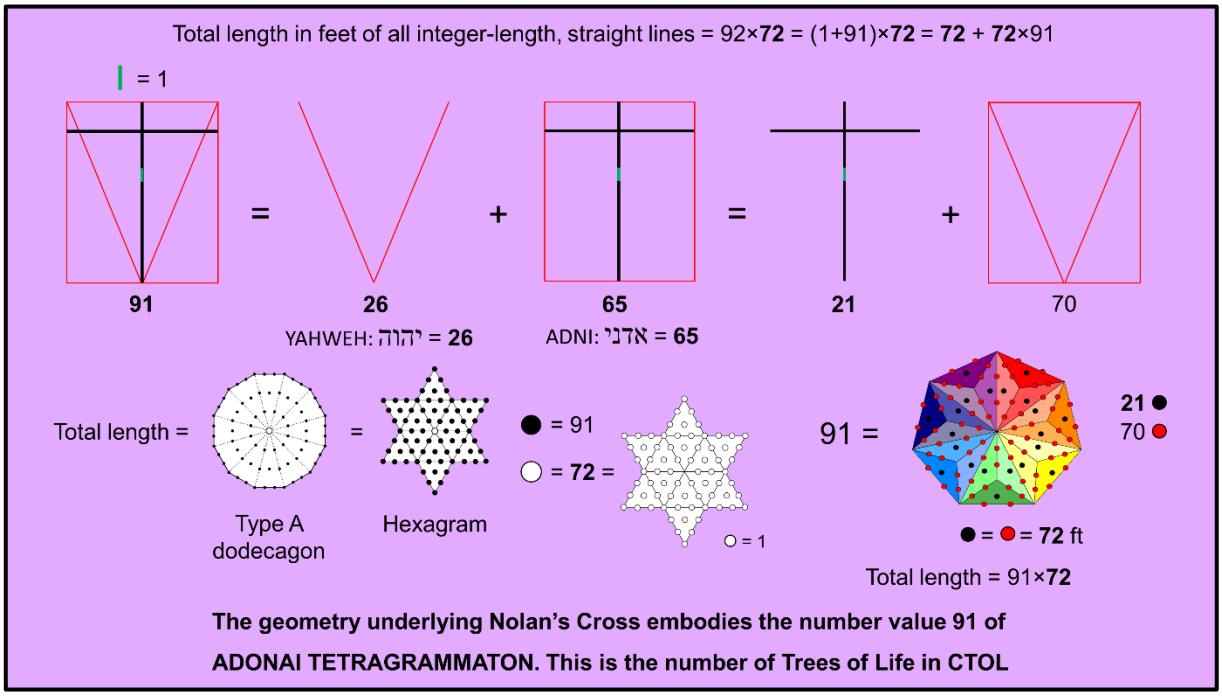


Figure 84. The hexagram and the heptagon represent the number value 91 embodied in the geometry of Nolan's Cross.

43. The geometry underlying Nolan's Cross embodies the number of Trees in CTOL

The straight line joining Cone E to either top corner of the rectangle is the hypotenuse of a right-angled triangle whose two other sides have lengths of 12 units and 5 units. By Pythagoras's theorem,

$$12^2 + 5^2 = 169 = 13^2.$$

The length of the hypotenuse is therefore 13 units. There are four lines with this length, which is the largest of the lengths of the straight lines that can be drawn within the rectangle. No straight line other than these that is not part of the cross has a length that is an integer. The length of this line and its mirror image is (2×13=**26**), which is the number value of YAHWEH, the Godname assigned to Chokmah, the second Sephirah. The length of the triangle with these two inclined sides and the top side of the rectangle as its third side is **36** units. This is the number value of ELOAH, the Godname assigned to Geburah. The total length of the rectangle (44), the cross (22) and the two inclined lines (**26**) is 92. The length of all lines surrounding the unit core is 91. This number displays the division:

$$91 = \mathbf{26} + \mathbf{65},$$

where **65** is the number value of ADONAI, the Godname of Malkuth, which Jews substitute for YAHWEH when they read the Torah because of the ancient rule that the Tetragrammaton should not be pronounced. As 91 is the sixth square pyramidal number:

$$91 = 1^2 + 2^2 + 3^2 + 4^2 + 5^2 + 6^2,$$

it is the sum of a triangular array of **21** integers 1-6, where **21** is the number value of EHYEH, the Godname assigned to Kether, the first Sephirah:

$$91 = 1^2 + 2^2 + 3^2 + 4^2 + 5^2 + 6^2 =$$

1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
6 6 6 6 6 6

$$= \mathbf{26} + \mathbf{65}.$$

This is the arithmetic counterpart of the geometry implicit in Nolan's Cross. Outside its core, its two lines have a length of **21** units, so that the rectangle and two inclined sides have a length of 70 units.

The division:

$$91 = \mathbf{21} + 70$$

appears in the Type B heptagon, which has 91 hexagonal yods (see Fig. 84). They consist of **21** black hexagonal yods at the centres of its **21** tetractyses and 70 red hexagonal yods lining their sides. They also comprise (7×7=**49**) hexagonal yods either at centres of tetractyses or lining sides of the seven sectors of the heptagon and (7×6=42) hexagonal yods that line the **21** sides inside sectors. They symbolise the **49** subplanes of the cosmic physical plane and the 42 subplanes of the six cosmic superphysical planes.

Including the core (**72** ft), the total length in feet= **72** + 91×**72**. As **72** yods surround the centre of the Type A dodecagon, this length can be represented by assigning the number **72** to the centre of the dodecagon and the number value 91 of ADONAI TETRAGRAMMATON to each one of the **72** yods surrounding it. Alternatively, as the hexagram constructed from tetractyses has **73** yods, where **73** is the number value of Chokmah, it can be generated by assigning the number 91 to each of the **72** yods surrounding its centre, which can be regarded as a similar hexagram with **72** yods, each symbolising the number 1, that surround its centre. Each yod denotes a length of one foot. The centre of the ancient symbol of the hexagram corresponds to the **72** ft-long core of Nolan's Cross, which is the metaphysical centre of the complete geometrical construction. In terms of Kabbalah, it stands outside the Tree of Life, being the source of Creation, namely, Ain, Ain Soph & Ain Soph Aur. In order to express this correctly, the designer(s) of the cross had to scale it so that the complete construction was not 91 units long but 92 units.

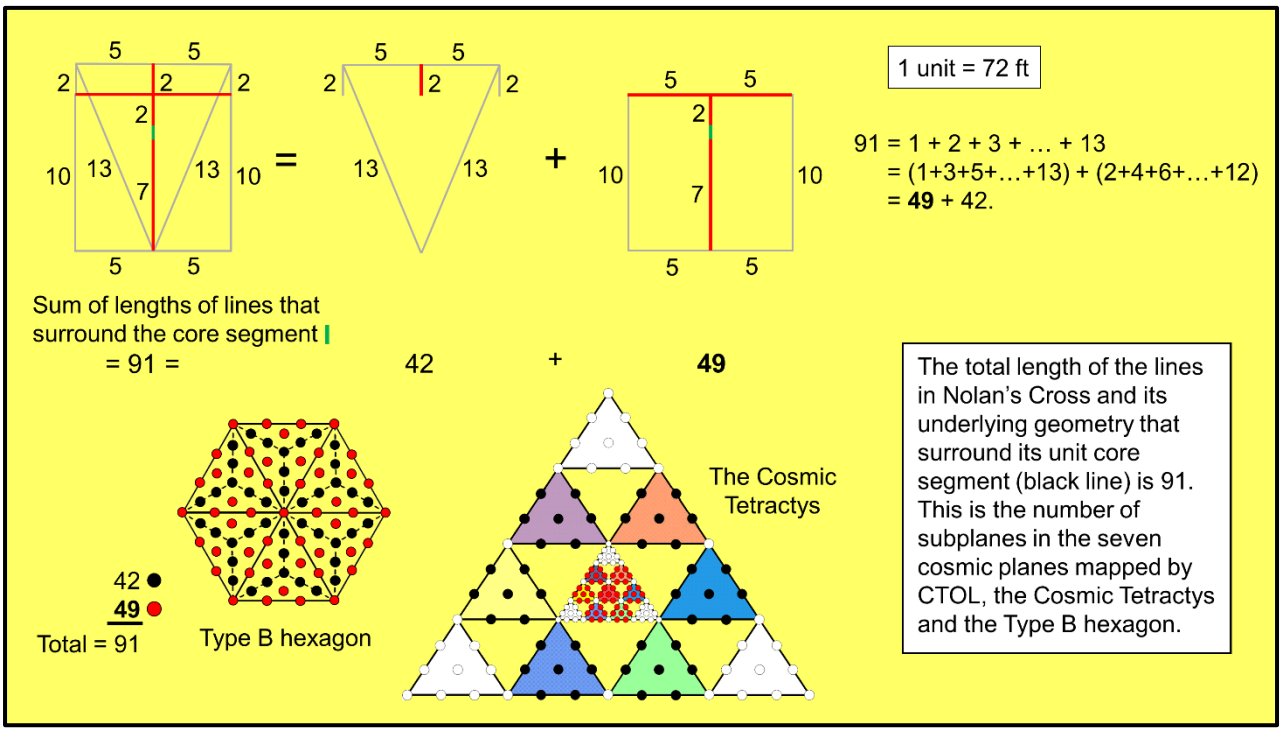


Figure 85.The geometry underling Nolan's Cross embodies the **49**:42 division of CTOL.

44. All integer-valued lines represent CTOL

The core unit segment in Nolan's Cross (denoted by the green line in Fig. 85) is the metaphysical fulcrum, or source, of the spiritual Whole mapped by the cross and other straight lines with lengths that have integer values in terms of the unit of **72** ft. The cross is of length 22 units, the enclosing rectangle is 44 units long and the two inclined lines have a length of **26** units. The sum of all their lengths is 92. Lines of total length 91 surround the core unit segment. This is the sixth square pyramidal number:

$$91 = 1^2 + 2^2 + 3^2 + 4^2 + 5^2 + 6^2 =$$

1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
6 6 6 6 6 6

It is prescribed by the number value **21** of EHYEH, the Godname of Kether, because this triangular array contains **21** integers. The sum of the six integers 1-6 is **21**, which is the length of the lines in the cross that surround the core. The sum of the six 6's is **36**, which is the length of the right-angled triangle with sides of length 5, 12 & 13. The sum of the **15** other integers = 55, which is both the *tenth* triangular number:

55 =
1
2 3
4 5 6
7 8 9 10

and the *tenth* Fibonacci number. Including the distance of two units between Cone A and the Head Stone, the total length of both inclined lines and the lines above the arms of the cross is 42, whilst the sum of the lengths of the remaining lines surrounding the unit core is **49**. These numbers are, respectively, the number of subplanes in the six cosmic superphysical planes and the number of subplanes in the cosmic physical plane. As 91 is the 13th triangular number:

$$91 = 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 + 13,$$

the sum of the seven odd integers is **49** and the sum of the six even integers is 42. This geometrical partition expresses the arithmetic division of the even and odd integers making up the number 91.

The primary **49**:42 division between physical and superphysical subplanes is represented in the Cosmic Tetractys. This is generated by replacing the 1st-order tetractys at the centre of the 2nd-order tetractys by another 2nd-order tetractys (this is the mathematical implementation of the hermetic principle "As above, so below"). The (7×7=**49**) hexagonal yods in the seven 1st-order tetractyses symbolising the seven Sephiroth of Construction (the red yods in Fig. 85) are surrounded by (6×7=42) black hexagonal yods in the six 1st-order tetractyses symbolising the six Sephiroth of Construction above Malkuth. The seven cosmic planes are the expression of the seven Sephiroth of Construction, as are the seven subplanes of each plane. The two sections of the rectangle express the cosmic manifestation of the metaphysical distinction between physical and superphysical planes of existence. Each red and black hexagonal yod denotes one unit of distance (**72** ft).

The same **49**:42 division appears in the Type B hexagon. Of its 91 yods. 49 red yods either line sides of its six sectors or are centres of its 18 tetractyses and 42 black yods line tetractyses within sectors. The seven red yods at the corners and centre of the hexagon correspond to the length of seven units between Cone E and the core segment. They symbolise the seven subplanes of the physical plane.

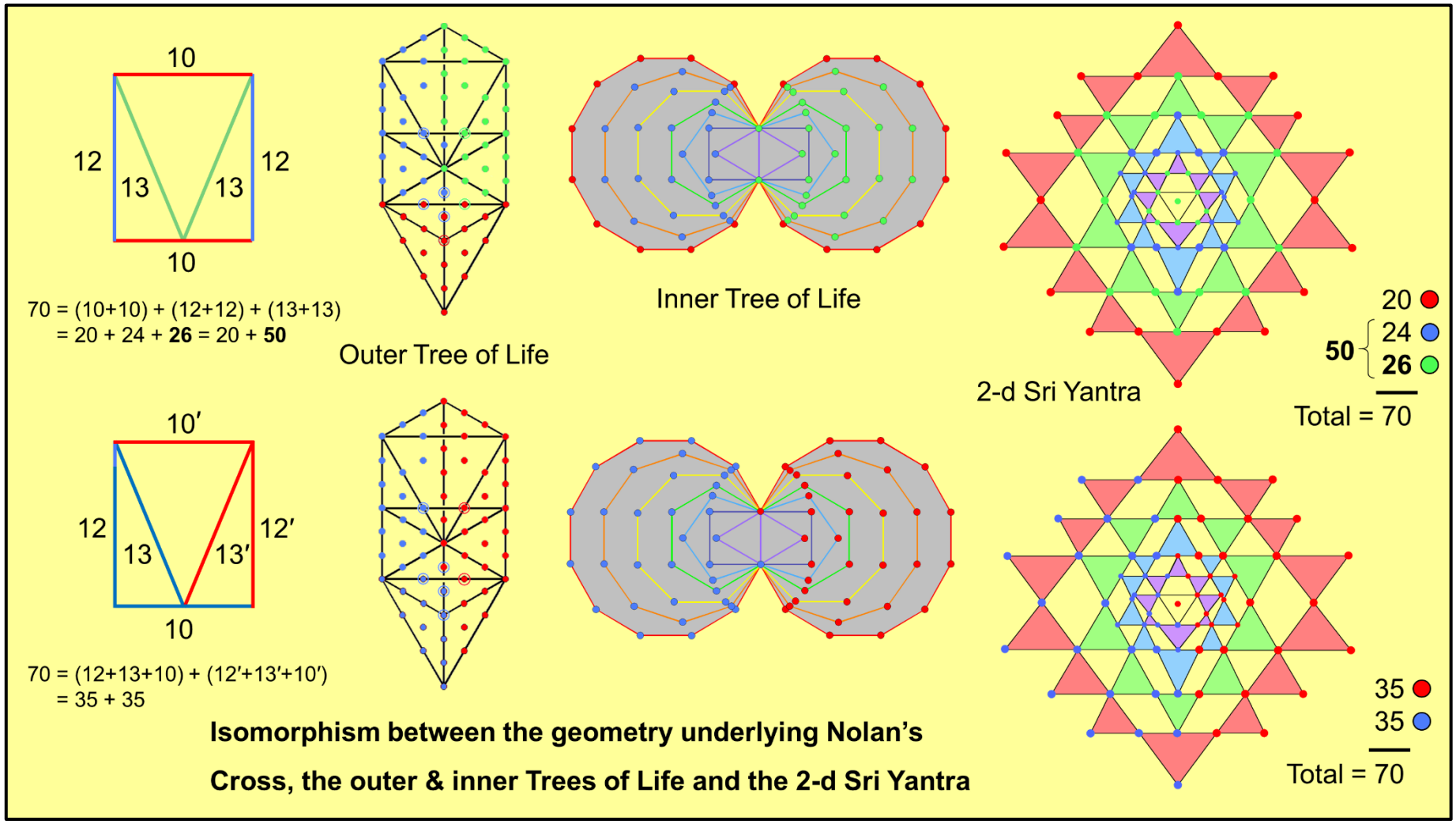


Figure 86.The counterpart in the Tree of Life & Sri Yantra of the structural parameter 70 in Nolan's Cross.

45. The scaffolding of Nolan's Cross in the outer/inner Trees of Life & the 2-d Sri Yantra

The length of the rectangle enclosing Nolan's Cross is 44 units (1 unit = **72** ft). The length of the hypotenuses of the two right-angled triangles is **26** units. The rectangle and two hypotenuses are (44+**26**=70) units long. They comprise two horizontal red lines of length (10+10=20) units and four vertical or inclined lines of length (12+13+13+12=**50**) units. This 20:**50** division of 70 appears in the outer Tree of Life because, when its 16 triangles are tetractyses, it has 70 yods, of which 20 yods lie on the faces of tetrahedron with vertices at Netzach, Hod, Yesod & Malkuth, leaving **50** yods. The two numbers 20 & 50 arise because the number of yods in the n-tree ≡ Y(n) = **50**n + 20. Each successive Tree of Life adds Y(n+1) – Y(n) = **50** yods. It also appears in the inner form of the Tree of Life. Its (7+7) enfolded polygons have 70 corners, of which 20 red corners belong to the two dodecagons outside their shared side and **50** corners belong to the remaining (6+6) polygons, consisting of the **26** green corners of the right-hand set of six polygons and the 24 blue corners of the other set outside their shared side. This **26**:24 division of the **50** corners corresponds to the **26** green yods in the right-hand side of the outer Tree of Life and the 24 blue yods in its left-hand side.* They correspond to the two hypotenuses of length (13+13=**26**) units and to the two vertical lines of length (12+12=24) units. Notice that two combinations of polygons exist, each having 12 blue corners that match the two vertical lines, each 12 units long:

	triangle	**square**	**pentagon**	**hexagon**	**octagon**	**decagon**
Number of corners outside shared side	1	2	3	4	6	8

because either:

$$1 + 3 + 8 = 12 = 2 + 4 + 6$$

or

$$1 + 2 + 3 + 6 = 12 = 4 + 8.$$

In the 2-d Sri Yantra, the fourth layer comprises 14 red triangles with 20 red corners that belong solely to this layer. The 18 blue & green triangles in the first and third layers have 22 such intrinsic corners (coloured green). Including the bindu at the centre of the central triangle and its three corners (coloured green), this totals **26** green yods. The 10 blue triangles in the second layer have 20 blue corners and the eight violet triangles have four blue corners that touch the sides of blue triangles, making a total of 24 blue corners. Including the bindu, there are 70 points in the 2-d Sri Yantra that divided into sets of 20, 24 & **26**, that is, into 20 corners that are intrinsic to the triangles in the fourth layer, corresponding to the two horizontal lines of length 20 unit, and **50** green & blue corners that are intrinsic to either the central triangle or the 28 triangles in the first three layers; these correspond to the **50** yods outside the tetrahedron in the Tree of Life and to the four vertical or inclined lines of length **50** units. The mirror symmetry of the Sri Yantra when reflected in a mirror aligned with the vertical axis means that the three sets of points divide into two sets of 10, 12 & 13. They match the two sets of three lines with lengths of 10, 12 & 13.

Due to its axial symmetry, each half of the 2-d Sri Yantra has (70/2=35) points (coloured red and blue in Fig. 86). For counting purposes, the bindu at the centre of the central triangle must be associated with the 34 points in one half of the Sri Yantra. It may seem that it should not matter which half is chosen. However, the bindu point, as the source of all existence, corresponds to Kether of the Tree of Life, and this point is part of the red half of the Tree, and therefore the bindu should be coloured red and associated with the red half of the Sri Yantra. The lowest corner of the central triangle must be coloured blue and associated with the 34 blue corners in the left half of the Sri Yantra. The counterpart in the inner Tree of Life of the 35:35 division is the 35 corners associated with each set of seven enfolded polygons. Its counterpart in the rectangle enclosing Nolan's Cross is the two sets of three red or blue lines, each set being 35 units long. Following the same convention that structural elements that are mirror images of themselves are sorted into two sets that are formally associated with either the left or the right halves, the top side of the rectangle associated with the two red lines on the right side is coloured red and the bottom side associated with the two blue lines on the left is coloured blue.

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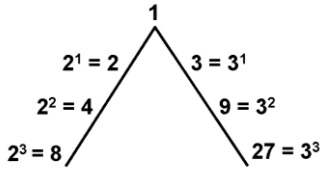
* Two yods on the central Pillar of Equilibrium project onto the two endpoints of the root edge shared by all the polygons. Because of this association, they are coloured green in Fig. 86 to match the colour of the yods at the **26** corners of the right-hand set of polygons.

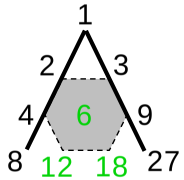
God the architect

Sum of 7 numbers = 54

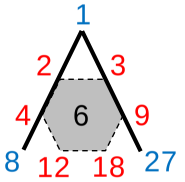


Plato's Lambda

Sum of 10 numbers = 90

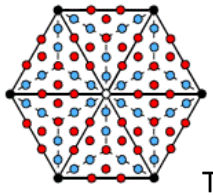


Lambda Tetractys



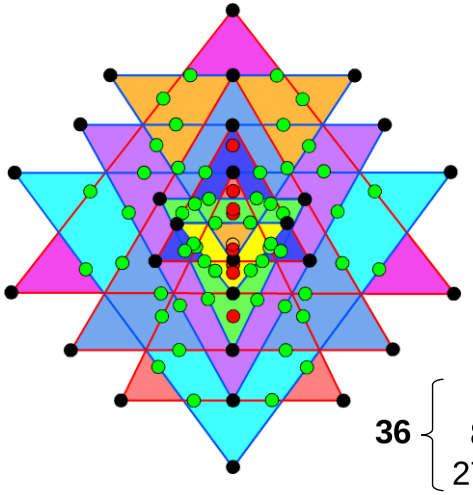
= 90 = **36** + **48** + 6

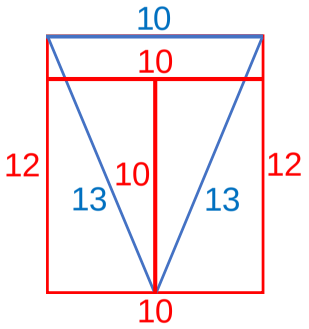
90 yods surround the centre of the Type B hexagon



36 ●
48 ●
6 ●
Total = 90

Turned into tetractyses, the 9 parent triangles forming the Sri Yantra contain 90 yods





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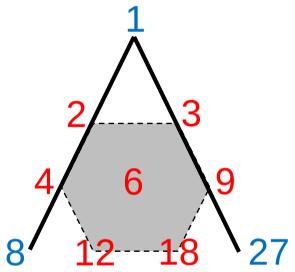

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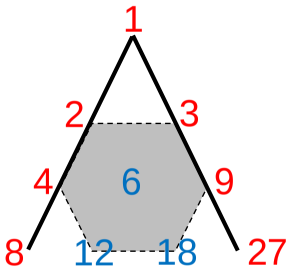


36 { 1 ○, 8 ●, 27 ●, 54 ● }
Total = 90

10 + 13 + 13 = **36**

1 + 8 + 27 = **36** = 6 + 12 + 18

12 + 10 + 12 + 10 + 10 = 54

2 + 3 + 4 + 6 + 9 + 12 + 18 = 54 = 1 + 2 + 3 + 4 + 9 + 8 + 27

Figure 87. The correspondence between Nolan's Cross & its enclosing rectangle, the Lambda tetractys and the Sri Yantra.

46. Correspondence between Nolan's Cross, the Lambda Tetractys & the 2-d Sri Yantra

Plato's Lambda — historical background

In *Timaeus*, Plato's treatise on Pythagorean cosmology, the central character, Timaeus of Locri, describes how the Demiurge divided the World Soul into harmonic intervals. Having blended the three ingredients of the World Soul — Sameness, Difference and Existence — into a kind of malleable stuff, the Demiurge took a strip of it and divided its length into portions measured by the numbers forming two geometrical series of four terms each: 1, 2, 4, 8 and 1, 3, 9, 27, generated by multiplying 1 by 2 and 3 (Fig. 87). This became known as "Plato's Lambda" because of its resemblance to Λ, the Greek letter lambda. The sum of these seven numbers is 54. They line two sides of a tetractys array of ten numbers that the author calls the "Lambda Tetractys." From their relative proportions, the musicians of ancient Greece worked out the frequencies of the notes of the now defunct Pythagorean musical scale. The three numbers 6, 12 & 18 absent from the Lambda and adding to **36** are coloured green in Figure 87. The sum of the 10 integers is 90, the sum of the integers 1, 8 & 27 at the corners of the tetractys is **36** and the seven integers at the centre and corners of the grey hexagon add up to 54, those at its corners adding to **48**. Hence, the **36**:54 division is displayed by the Lambda Tetractys in two different ways. One of them differentiates between its corners, which in any tetractys always correspond to the Supernal Triad of the Tree of Life, and its seven hexagonal yods, which correspond to the seven Sephiroth of Construction.

Correspondences

The three blue sides in Nolan's Cross that form an isosceles triangle have a length of **36** units; the five remaining red lines having lengths that are integer multiples of the unit of **72** ft have a total length of 54 units. Cone A divides the top side of the rectangle in half so that the perimeter of the triangle consists of two inclined lengths, each 13 units long, and two horizontal lines, each five units long. In other words, Cone A divides the length of **36** units into two equal halves that are 18 units long. This mirrors the fact that, for the second way in which the **36**:54 division exists in the Lambda Tetractys, the sum of the three interpolated numbers 6, 12 & 18 = (6+12) + 18 = 18 + 18 = **36**. The sum of the ten numbers is 90. This is the length of all the integer-length lines except that joining Cone A to the Head Stone.

Type B hexagon

The Type B hexagon has 90 yods surrounding its centre, which is analogous to the Cone A-Head Stone line two units long. Its six corners correspond to the number 6 at the centre of the Lambda Tetractys. Its **36** blue hexagonal yods lining internal sides of the 18 tetractyses correspond to the sum (**36**) of the three blue integers 1, 8 & 27 at the corners of the Lambda Tetractys and to the length (**36** units) of the triangle in the geometry of Nolan's Cross, whilst its **48** red hexagonal yods on sides of sectors, at their centres or at centres of tetractyses correspond to the sum of the six red integers at the corners of the grey hexagon. A second way in which the **36**:54 division appears in the Type B hexagon comes from the fact that the Type A hexagon has six yods per sector, which increases by nine to **15** yods per sector for the Type B hexagon. This means that the Type A hexagon has **36** yods surrounding it centre, to which 54 yods are added in the Type B hexagon. However, they do not contain six yods of a different type from the others and therefore this does not allow the further division of 54 into 6 and **48**. The number 6 appears in Nolan's Cross as the distance of six units between the Head Stone and Cone D. To maintain consistency with this, the chosen division is that illustrated in Figure 87.

The Sri Yantra

Students of this well-known Hindu yantra know that its array of 42 triangles surrounding a central one is generated by nine triangles that are spaced apart. Four symbolising the Shiva (or male) principle point upwards in the plane containing the diagram and five symbolising the Shakti (female) principle point downwards. To help distinguish them, the nine triangles (which are separate, not overlapping) are shown in Figure 87 filled with different colours. Twenty-six of their 27 corners are corners of the 42 triangles. The lowest corner of the smallest, downward-pointing triangle (yellow) is the lowest corner of the triangle at the centre of the Sri Yantra; this is the lowest point of the orange triangle. The nine triangles are analogous to the nine *neteru* (gods & goddesses) of the ancient Egyptian pantheon and to the nine Sephiroth above Malkuth, the Sephirah signifying the material universe. The yellow triangle corresponds to Kether, the four pairs (male/female) of parent triangles correspond to the pairs of Sephiroth: Chokmah-Binah, Chesed-Geburah, Netzach-Hod & Tiphareth-Yesod.

Transformed into tetractyses, the nine parent triangles contain 90 yods, none of which coincide, as the triangles do not overlap. This number is both the sum of the 10 integers in the Lambda Tetractys and the total length of those lines in the Nolan's Cross geometry that have lengths that are integer multiples of **72** ft. The hexagonal yod at the centre of the yellow triangle is denoted by a circle. It corresponds to the unit core segment 144-**216** ft below the Head Stone (the centre of the array of three sections of the cross, each **168** yards long) and to the number 1 at the apex of the Lambda Tetractys. The eight red hexagonal yods at the centres of the other parent triangles correspond to the integer 8 at the second corner of the Lambda Tetractys. The 27 black corners of all nine triangles correspond to the integer 27 at its third corner. Finally, the 54 green hexagonal yods lining their 27 sides correspond to the sum of the seven integers at the corners and centre of the grey hexagon and to the length of the red lines in the rectangle enclosing Nolan's Cross. Each half has lines of length 27 units: 12 + 10 + 5 = 27. They correspond to the seven integers adding together as two 27s:

$$(2+4+3+6+12) + (9+18) = 27 + 27 = 54$$

and to the 27 green hexagonal yods lining sides of parent triangles that lie on either side of the central, vertical axis of the Sri Yantra.

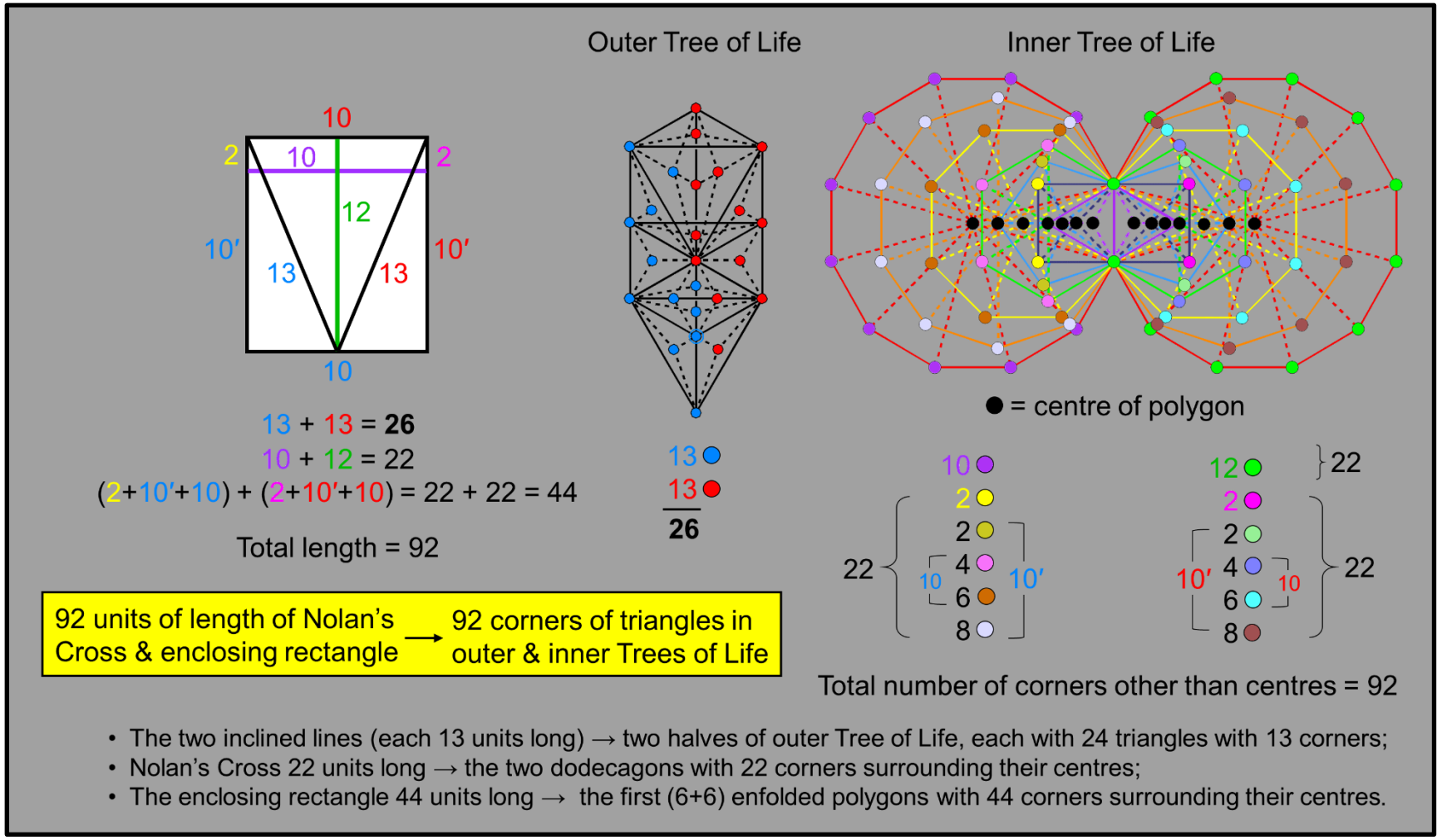


Figure 88. The outer & inner Trees of Life as the counterpart of the complete Nolan's Cross geometry.

47. Parallels between the Nolan's Cross geometry and the outer & inner Trees of Life

We will now investigate how the number 92 — the number of units of length of all the lines making up the complete geometry of Nolan's Cross — is embodied in the geometry of the outer & inner Trees of Life.

The 16 triangles in the outer Tree of Life have 10 corners. When they are Type A, each triangle is divided into three sectors, so that the (16×3=**48**) triangles now have (10+16=**26**) corners, where **48** is the number value of *Kokab*, the Mundane Chakra of Hod. The (7+7) enfolded Type A polygons making up the inner Tree of Life have **80** corners. They include (7+7=14) centres of polygons, so that (**80**−14=66) corners surround them (Fig. 88). The number of corners in the outer & inner Trees of Life that are not centres = **26** + 66 = 92. They correspond to the total length of 92 units in the rectangle, inclined lines & Nolan's Cross. The **26** corners in the outer Tree correspond to the two inclined lines with length **26** units and the 66 corners surrounding centres of polygons correspond to the rectangle & Nolan's Cross. Of the **26** corners, 10 corners are aligned with the Pillar of Equilibrium, leaving eight corners located on one side of it that are mirror images of their counterparts in the other half when this pillar lies in the plane of a mirror that is perpendicular to the plane containing the two side pillars. The 10 corners are mirror images of themselves, but the top five corners can be associated with one side and the lowest five corners can be associated with the other side. This means that (5+8=13) corners (red or blue) can be associated with each half of the outer Tree of Life. They correspond to the two inclined lines 13 units long, which are mirror images. The two joined dodecagons have 22 corners that correspond to the 22 units in the length of Nolan's Cross. The 12 green corners of one dodecagon correspond to the vertical stem of the cross 12 units long and the 10 violet corners outside the shared root edge correspond to the 10 units of length of its arms. The two green endpoints of this root edge correspond to the two units of length between Cone A and the Head Stone. The two triangles do not participate in the analogy between the Nolan's Cross geometry and the polygons because they have corners that coincide with the centres of the two hexagons. The pair of two corners of the two squares outside the root edge correspond to the two vertical lines of length two units between the arms of the cross and the top side of the rectangle. The pentagon and the decagon have 10 corners surrounding centres; each pair corresponds to the two vertical sides of the square of length 10 units. The hexagon and the octagon on each side of the root edge have 10 corners that correspond to the top and bottom of the rectangle with length 10 units. The 14 polygons form three sets of 22 corners; one set is distinguished from the two others because it is its mirror images, whereas the two other sets are mirror images of each other. Their counterparts are Nolan's Cross 22 units long and the two pairs of vertical & horizontal sides of the rectangle that are 22 units long.

Outside the root edge and surrounding centres of polygons are **64** corners, where **64** is the number value of *Nogah*, the Mundane Chakra of Netzach. Together with the **26** corners of the **48** triangles in the outer Tree of Life, they form a set of 90 corners. This number is the sum of the 10 number weights that make up the Lambda Tetractys (see previous section). The sum of the three numbers that needed to turn the Lambda into a tetractys = 6 + 12 + 18 = 18 + 18 = **36**. Compare this with the triangle with sides 13, 13 and 10 (further divided by the vertical section of the cross into two lines of length five units. We see that the triangle is formed by two lines of length (5+13=18) and two lines that are their mirror images. Therefore, the three numbers form the *same* pair of numbers 18 as that which measure the two halves of the triangle. Similarly, the Lambda consists of seven numbers that add up to 54:

27, 9, 8, 4, 3, 2,1.

The largest is 27, which is also the sum of the six other numbers. Just as the sum of all seven numbers divides naturally into two equal numbers 27, so, too, the length of all lines other than the sides of the triangle with length **36** units is 54 and comprises two sets of lines, each with length 27 units:

2 + 5 + 10′ + 10 = 27 = 2 + 5 + 10′ + 10.

This demonstrates that the geometric foundation of Nolan's Cross is a line representation of the separate outer and inner forms of the Tree of Life, using the lengths of lines to indicate the number of structural elements (in this case, corners of triangles) that make up these form.

Surrounding the centre of the Type A triangle are 18 yods (Fig. 89). This increases to 45 when it is Type B — an increase of 27 yods. Two Type A triangles contain (18+18=**36**) such yods and 54 more yods are added to two Type B triangles. Compare this with the triangle of length **36** units and the other lines of length 54 units in the geometry of Nolan's Cross. The 92 yods correspond to the total length of 92 units, the two centres corresponding to the distance of two units between Cone A and the Head Stone. The two Type A triangles determine the triangle of length **36** units and the extra 54 yods in the two Type B triangles correspond to the other lines of length 54 units. They contain the same **36**:54 division as that expressed by Plato's Lambda Tetractys.

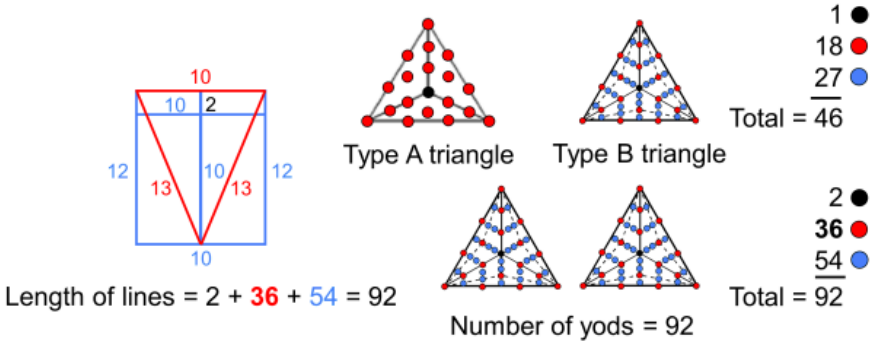
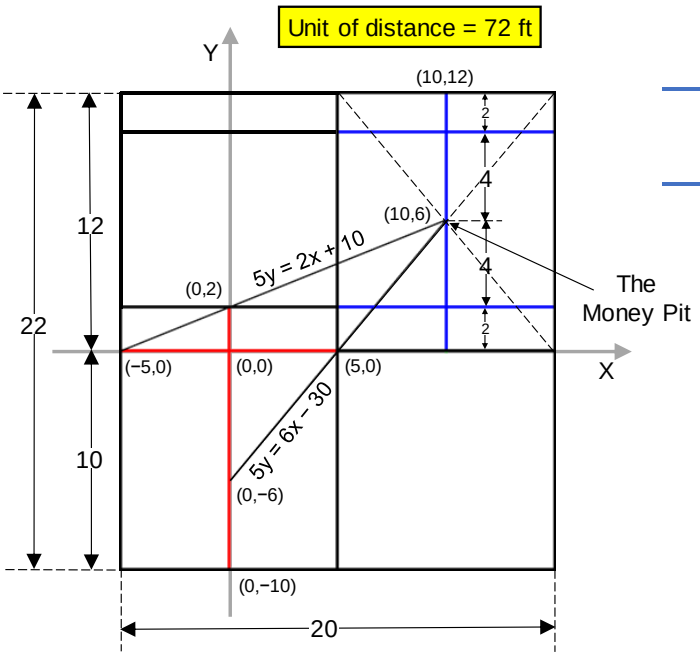


Figure 89. Correspondence between the geometry of Nolan's Cross and two Type B triangles.

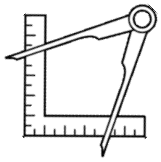
The eastern end of Oak Island

(© Gretchen Cornwall
https://gretchencornwall.com/about/)

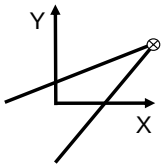


The Head Stone is located at (0,0).

A variant of the Cross of Lorraine, which was carried by the Knights Templars during their Crusades.



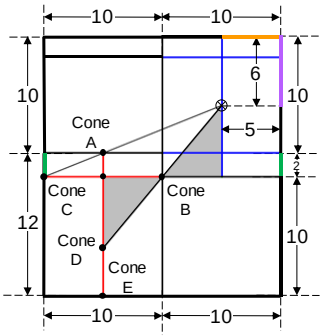
Mason square & compasses



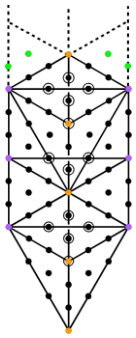
The Money Pit is located at the pivot (⊗) of the compasses

The two straight lines joining Cone A to C and Cone B to Cone D meet at the point (10,6). This is the *predicted* location of the Money Pit. It is at the *middle* of the vertical arm of two similar Nolan's Crosses (one inverted). These Latin crosses (coloured blue) form a variant of the Cross of Lorraine. Its centre is the point of intersection of the two diagonals of a 12×10 rectangle similar to that enclosing Nolan's Cross.

Figure 90. The predicted location of valuable artefacts buried on Oak Island.



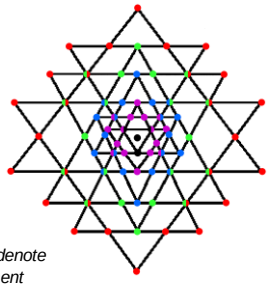
Total length of perimeter of Greater Rectangle = 84 units.



1-tree

4 ● outside 1-tree → | & |
6 ● Sephiroth on side pillars → |
5 ● Sephiroth on middle pillar → |
69 ●

Total = 84



(Circles with two coloured semi-circles denote the two corners of triangles in two adjacent layers that are directly above/below each other).

42 triangles with 84 corners surround the central triangle of the 3-d Sri Yantra.

Figure 91. The holistic parameter 84 embodied in the 1-tree and the 3-d Sri Yantra is the length in units of 72 ft of the perimeter of the Greater Rectangle.

48. A Kabbalistic reason for where the Money Pit is located

Researchers into the mystery of Oak Island strongly suspect that it not a coincidence that the straight line joining Cone A and Cone C intersects the straight line joining Cone B and Cone D at the very location of the Money Pit. However, they have offered no theoretical justification for this choice; a line joining Cones B and Cone E also intersects the line joining Cone A and Cone C at a point on dry land at the east end of the island, so that a reason needs to be given why those who designed the layout of the site where they had buried treasure did not choose this spot. Given the great care that they took in this task, it seems highly unlikely that the location was chosen for purely practical reasons. For the builders, this was a sacred task that required a sacred reason for the chosen burial site. Just as cone-cone distances in Nolan's Cross conform both in absolute magnitude and in proportion to the geometrical and yod compositions of the outer and inner Trees of Life, so there could be no arbitrariness in where artefacts of great religious value should be stored. The *true*, complete length of Nolan's Cross is 22 units, where 22 is the number of letters in the Hebrew alphabet and the number of Paths in the Tree of Life; the unit of length is 72 ft, where 72 is the number of names of God. Given the Kabbalistic nature of these measurements, it is reasonable to suppose that the location of the burial site had, likewise, to conform to Kabbalistic considerations. The following analysis confirms this supposition.

Taking the Head Stone as the origin of a rectangular coordinate system with X and Y axes parallel to the horizontal and vertical arms of Nolan's Cross (coloured red in Fig. 90), the straight line passing through Cones A & C:

$$5y = 2x + 10$$

and the straight line passing through Cones B & D:

$$5y = 6x – 30$$

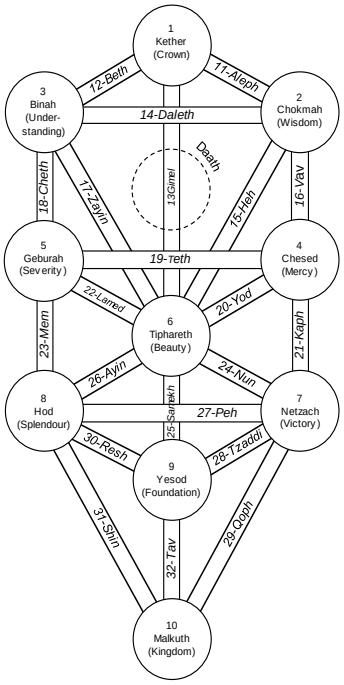
intersect at x = 10, y = 6. This point is six units east of the horizontal arm and five units south of Cone B. It is the centre of a 12×10 rectangle like that enclosing Nolan's Cross (let us call it "Nolan's Rectangle"). If the sides of these two rectangles are extended to form a larger rectangle made up of four Nolan's Rectangles, the point of intersection is the middle of a Cross of Lorraine, or, rather, its earliest version, in which the two bars are of the same length. It is the combination of a Latin cross and its inverted form (called the "Peter cross"). We see that one of the insignias of the Knights Templars appears in the Nolan's Rectangle whose centre is the location of the Money Pit, believed by many students of the Oak Island mystery to have been built by a party of Templars who sailed to what became Nova Scotia. Templars were the forerunners of Freemasonry. Its well-known symbol of a mason square and compasses can be recognised in the form of the pair of intersecting lines, which form the arms of the compasses, and the perpendicular, positive X and Y axes, which measure distances in the manner of the graduated sides of a square. The pivot of these analogous compasses is *located at the predicted site of the Money Pit, the focus of all the construction on Oak Island*. As basic building tools, the square and compass have been used for thousands of years in many countries. One can only speculate whether it entered the thinking of those who decided to bury the wealth of the Templars on the island. If so, it was, of course, not the only reason for the use of Nolan's Cross to encrypt the location of the Money Pit, otherwise its measurements would not emerge, as demonstrated in this article, as sacred numbers that parametrise the sacred geometries of various religions.

The rectangle enclosing the four overlapping Nolan's Rectangles is 20 units wide (480 yds) and 22 units long (528 yds); it will be called the "Greater Rectangle." Its perimeter is 84 units long, where

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

This number is a parameter of sacred geometries. It appeared in earlier sections in the context of CTOL, which has 84 Trees of Life above the 7-tree mapping the physical plane. The two pairs of adjacent sides, each 42 units long, correspond to the 42 planes in the cosmic physical plane above the physical plane and to the 42 cosmic superphysical planes. Each unit of distance measured along a side of the Greater Rectangle corresponds to a Tree of Life. There are also 84 yods up to the level of the top of the 1-tree when its 19 triangles are tetractyses (Fig. 91). They include four green yods (two on each side) outside the 1-tree up to the level of its apex, six violet yods at the positions of Sephiroth on the side pillars and five orange yods at the positions of Sephiroth on the Pillar of Equilibrium. Compare this with the fact that the Money Pit (⊗) is predicted to be at the centre of the Cross of Lorraine in the top right-hand corner of the Greater Rectangle six units below its top side and five units to the left of its right side. The Money Pit is located at the point where Cone D would be if the triangle (coloured grey in Fig. 91) with the Head Stone, Cone B and Cone D as its corners were rotated clockwise 180° around Cone B.

The number 84 also appears in the 3-d Sri Yantra as the number of corners of its 42 triangles (see Fig. 91). There are two corners per triangle, so that they comprise 42 pairs of corners. This corresponds to the



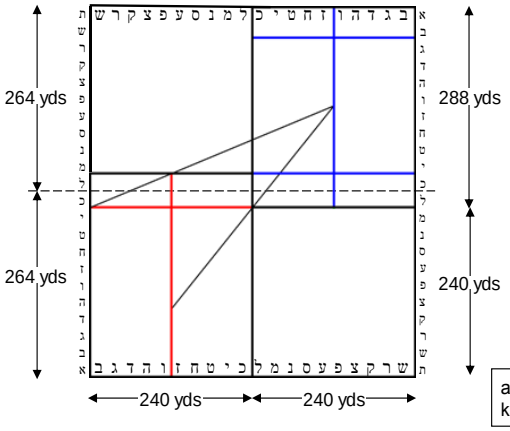
The Tree of Life

The 22 letters of the Hebrew alphabet

1 א aleph	12 ל lamed
2 ב beth	13 מ mem
3 ג gimel	14 נ nun
4 ד daleth	15 ס samekh
5 ה heh	16 ע ayin
6 ו vav	17 פ peh
7 ז zayin	18 צ tzaddi
8 ח cheth	19 ק qoph
9 ט teth	20 ר resh
10 י yod	21 ש shin
11 כ kaph	22 ת tav

Length of perimeter = 84 = $1^2 + 3^2 + 5^2 + 7^2$.

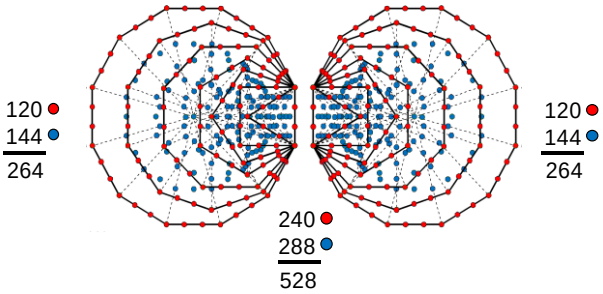
84 units = 84×72 ft = 168×36 ft = 12×168 yds = 2016 yds.



Each Hebrew letter can be associated with a unit segment 24 yards long.

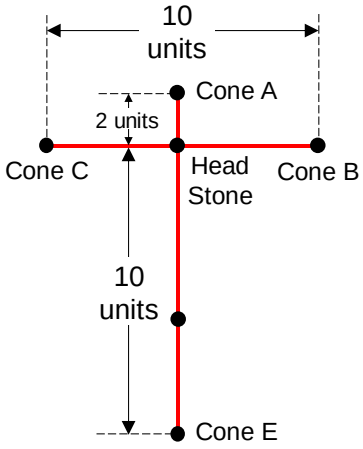
11 units = 11×24 yds = 264 yds.
22 units = 2×264 = 528 yds.
10 units = 240 yds.
12 units = 12×24 = 288 yds.
528 yds = 240 yds + 288 yds.

aleph–yod→trunk 10 units long
kaph –tav→branches 12 units long.

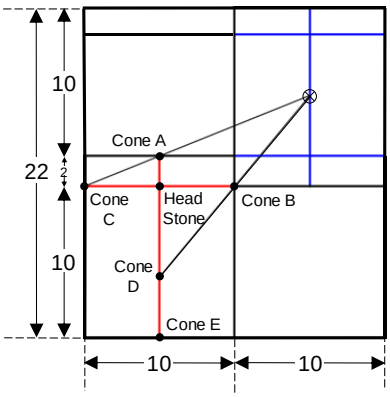


The two sets of 11 Hebrew letters correspond to the two separate halves of the inner Tree of Life.

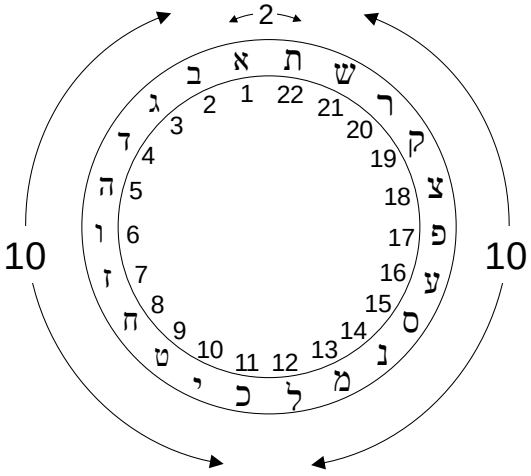
Figure 92 .Four sets of the 22 letters of the Hebrew alphabet associated with the 22 Paths of the Tree of Life can be assigned to the 84-unit long perimeter of the Greater Rectangle, each letter symbolising a unit length of 24 yards. The two pairs of adjacent sides, each 264 yds long, correspond to the two halves of the inner Tree of Life, each of which contains 264 yods.



Nolan's Cross



Greater Rectangle



22 Hebrew letters

Figure 93. Nolan's Cross can be built from 22 basic units of length 72 ft that can be associated with the 22 Hebrew letters. The Greater Rectangle can be generated from four sets of 22 letters, arranged consecutively.

Greater Rectangle being a *pair* of right-angled triangles, each of whose base and perpendicular sides are (20+22=42) units long. The four layers of triangles in the 3-d Sri Yantra have eight, ten, ten & 14 triangles. The first & fourth layers have (8+14=22) triangles and the second & third layers have (10+10=20) triangles. Hence, the number of their corners is

$$84 = 2\times22 + 2\times20,$$

which is the length of the four sides of the Greater Rectangle. The two shorter sides, each (10+10=20) units long, are analogous to the second & third layers with (10+10=20) triangles; the two longer sides, each (12+10=22) units long, correspond to the first & fourth layers with (8+14=22) triangles. As the distance between Cone A and Cone D is eight units, the distance 12 between Cone A and Cone E = 8 + 4, so that 22 = 8 + 4 + 10 = 8 + 14, which matches the number of triangles in the first & fourth layers of the 3-d Sri Yantra. An isomorphism therefore exists between the Greater Rectangle and the Sri Yantra. It establishes the holistic nature of the former because the latter is a representation of the Divine Whole.

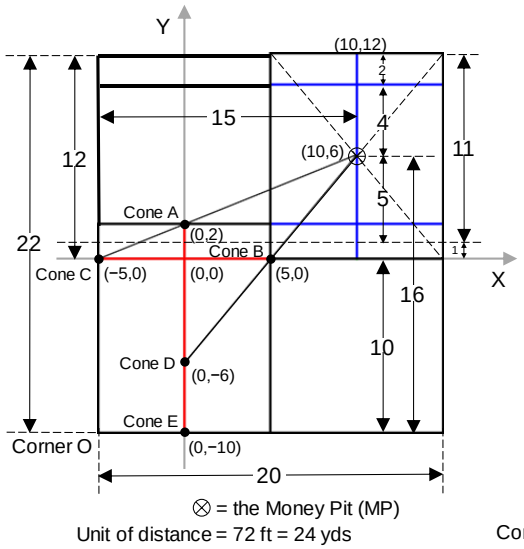
The Hebrew alphabet has 22 letters (the five so-called "finals" that replace these letters when they end a word have been devised for convenience in reading and play no part in the mathematics that underlies the cosmos). In Kabbalah, the 22 letters are assigned to the 22 Paths of the Tree of Life (Fig. 92). Together with the 10 Sephiroth, the Paths form, as it says in the first line of the *Sefer* Yetzirah, the "*32 mystical paths of wisdom.*" The length of the longer side of the Greater Rectangle is 528 yds, where 528 is the 32nd triangular number:

$$1 + 2 + 3 + \ldots + 32 = 528.$$

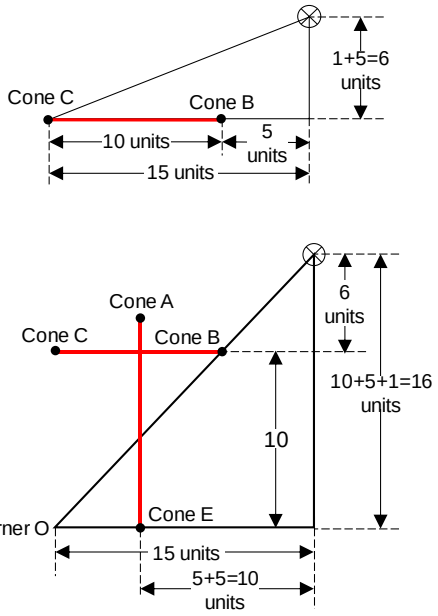
This is the total length of Nolan's Cross. The length of the shorter side is 480 yds. As 528 = 22×24 and 480 = 20×24, each unit distance of 24 yds along the two vertical sides of the Greater Rectangle can be assigned one of the 22 Hebrew letters, whilst each unit distance along its two horizontal sides can be assigned one of the 20 letters between the first and last one. 84 letters in sequential order can be imagined lining the Greater Rectangle. The first 11 letters line half of a vertical side (the lower half is chosen in Fig. 92) and the second set of 11 letters line its second half. The two sets generate two vertical lines of length 11 units (264 yds). The two sets of 10 letters between the first and last ones generate horizontal lines of length 240 yds. The length of a vertical side of Nolan's Rectangle is 288 yds; when two such rectangles overlap, 48 yards disappear in their combined length, which is 528 yds. This is the number of yods in the two separate halves of the inner Tree of Life. They are the geometrical counterpart of the two sets of 11 Hebrew letters, each symbolising a unit length of 24 yds. They comprise 240 red yods that line sides of polygons and 288 internal blue yods. In relation to Nolan's Cross, they correspond to the length of 240 yds in the vertical arm up to the Head Stone and the remaining length of 288 yds. They are the expression of the 10 Paths of the trunk and the 12 Paths of the branches of the outer Tree of Life. The two extra Paths in the latter express the distance of (2×24=48) yds between Cone A and the Head Stone. The two units of length between Cone A and the Head Stone should be understood as one associated with the 10 units of length between the Head Stone and Cone E and one associated with the 10 units of length between Cone B and Cone C. This divides the 22 units of length of Nolan's Cross into two equal lengths of 11 units — the counterpart of dividing the 22 Hebrew letters into two sets of 11. This is indicated in Fig. 92 by the dashed line between the letters kaph and lamed lining each vertical side of the Greater Rectangle. Another way of relating the 2:20 division in the geometry of both Nolan's Cross and the Greater Rectangle to the 22 Hebrew letters is to imagine them arranged around the circumference of a circle (Fig. 93). Aleph and tav — the first and last of the 22 letters — are then next to each other, with 10 letters arranged around each half of the circle. Aleph and its associated unit segment belongs to one set of 11 letters and tav and its associated unit segment is associated with the second set. The first and last letters represent the Cone A-Head Stone line two units long, whilst the horizontal and vertical lengths of Nolan's Cross, each 10 units long, correspond to the two sets of 10 letters between aleph and tav. To be consistent with this, we should count down a vertical side of the Greater Rectangle, starting with aleph at its middle, and then continue with the 12th letter at the top of this side, ending with tav one unit below the level of Cone A. Stringing the letters along the four sides of the Greater Rectangle will require four sets of 22 letters, whatever the starting point.

The Money Pit is located at a point that is six units from the lower end of the Nolan's Cross enclosed by a rectangle and four units from the intersection of its vertical and horizontal arms. This 6:4 division in the vertical arm has its counterpart in the trunk of the Tree of Life:

point
line
triangle
tetrahedron



Length of perimeter of rectangle = 84 = $1^2 + 3^2 + 5^2 + 7^2$.
Horizontal distance of MP from O = 15 = 3 + 5 + 7.
Vertical distance of MP from O = 16 = 1 + 3 + 5 + 7.



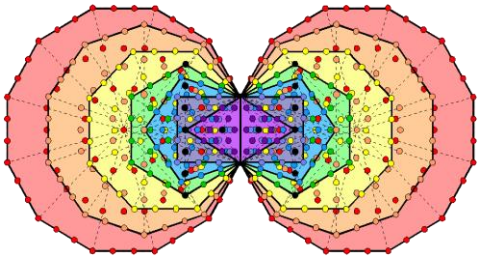
Cone C
10 + 5 + 1 + 5 = 21.
AHIH = אהיה = 1 + 5 + 10 + 5 = 21.
10 + 5 = 15.
YAH = יה = 10 + 5 = 15.

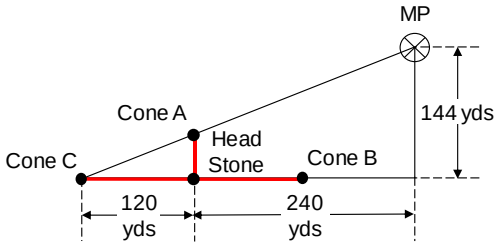
Cone E
5 + 5 + 10 + 6 = 26.
YHVH = יהוה = 10 + 5 + 6 + 5 = 26.

Corner O
15 + 10 + 5 + 1 = 30 + 1 = 31.
EL = אל = 1 + 30 = 31.

The number values of the Godnames Ehyeh, Yah & Yahweh are the sums of the X & Y coordinates of the Money Pit measured from Cone C and Cone E

Figure 94.





240 + 144 = 384

Shared: 16 ●
Unshared outside root edge: 504 yods

Triangle:	13 ●	60	Triangle:	13 ●	60	120 yods → 120 yards
Square:	21 ●		Square:	21 ●		
Pentagon:	26 ●		Pentagon:	26 ●		
Hexagon:	21 ●	192	Hexagon:	21 ●	192	384 yods → 384 yards
Octagon:	45 ●		Octagon:	45 ●		
Decagon:	57 ●		Decagon:	57 ●		
Dodecagon:	69 ●		Dodecagon:	69 ●		

The 504 yods outside the root edge that are unshared with the outer Tree of Life comprise 120 yods in the triangles, squares & pentagons and 384 yods in the other polygons. These intrinsic yods correspond to the 120 yards between Cone C and the Head Stone and the 384 yards between the latter and MP, measured horizontally & vertically.

Figure 95. The distance (504 yds) of MP from Cone C is one of the parameters of sacred geometries.

as the six edges of the tetrahedron and the four straight lines making up the Chokmah-Binah Path and the Chesed-Geburah-Tiphareth triangle. In terms of human psychology, it expresses the distinction between the personality (Netzach-Hod-Yesod-Malkuth) and transpersonal levels of being, starting with Tiphareth.

Research by the author (see his website and book "The Mathematical Connection between Religion and Science") has determined a large amount of evidence that the ancient Hebrew Godnames assigned in Kabbalah to the 10 Sephiroth of the Tree of Life mathematically prescribe holistic systems as realisations of the universal blueprint embodied in sacred geometries. We saw in Section 42 and elsewhere how the Godnames determine through their number values the architecture of Nolan's Cross. Examples are now given of how they characterise the location of the Money Pit (MP).

Figure 94 indicates that Cone C is 10 units from Cone B, which is five units from the vertical section of the second Nolan's Cross that passes through the Money Pit. Cone C is therefore (10+5=15) units from this line. The shorter Godname assigned to Chokmah, the second Sephirah, is YAH (יה or YH)). As Y = 10 and H = 5, its number = 10 + 5 = 15. MP is five units above the dashed line dividing the Greater Rectangle in half and this line is one unit above the bottom end of the second Nolan's Cross. The sum of the horizontal and vertical distances from Cone C to MP = 10 + 5 + 1 + 5 = 21. This is the number value of EHYEH (אהיה or AHIH), the Godname of Kether at the apex of the Tree of Life because A = 1, H = 5 & I = 10:

$$1 + 5 + 10 + 5 = 21.$$

As with YAH, each letter denotes through its number value the length in units of 24 yds of lines making up the geometry of the Greater Rectangle and its crosses. Cone E is five units from the vertical line passing through Cone B, which is five units from the vertical line passing through MP. The latter is six units above the horizontal line that is the extension of the arm of Nolan's Cross, it being 10 units above Cone E. Hence, the sum of the horizontal and vertical distances of the latter from MP = 5 + 5 + 10 + 6 = 26. Compare this with the number value 26 of the complete Godname YAHWEH (or YHVH):

$$10 + 5 + 6 + 5 = 26.$$

The lower, left-hand corner O of the Greater Rectangle is 15 units away from MP measured along its base. It is 10 units below the horizontal arm of Nolan's Cross, which is one unit below the middle of the Greater Rectangle (dashed line) and this is five units below MP. The sum of the lengths of the horizontal and vertices distances of MP from O = 15 + 10 + 5 + 1 = 30 + 1 = 31. This is the number value of EL (אל), the Godname of Chesed:

$$1 + 30 = 31.$$

The Hebrew word of the Divine Name EL, meaning "God," determines the location of MP relative to O. The number value 72 of Chesed is the unit of distance in feet that the Divine Names use to determine the position of MP. The sum of the distances of MP from the top left-hand corner of the Greater Rectangle = 15 + 2 + 4 = 21, as it is also when measured from its lower right-hand corner. The amazing significance of this property is that, as the length of the lines making up Nolan's Cross and surrounding the core unit segment is 21 units, this crucial length (504 yds or 1512 ft) leading from Cone C to MP is embodied in its geometry! As discussed in previous sections, the number 504 is a parameter of CTOL, being the number of SLs in the 84 Trees of Life as far down as the top of the 7-tree that maps space-time. It can be said that, just as this number marks the point in CTOL where space-time exists and matter becomes physical, i.e., the Malkuth level of the Tree of Life, so it defines the location of burial of what the builders of MP would have deemed the sacred, physical treasures of God. It appears in the 524 yods making up the (7+7) enfolded Type A polygons of the inner Tree of Life as the 504 yods that are unshared with its outer form (Fig. 95), that is, there are 504 yods that are intrinsic to its inner form. The number appears in the 3-d Sri Yantra as the number of corners, sides & triangles in the 42 triangles surrounding the central one when they are Type A, i.e., it measures their total geometrical composition. It is the number of yods surrounding the centre of the Type C dodecagon: 12×42 = 504. It is also the number of yods in the seven Type A dodecagons enfolded in the inner form of the 7-tree, which is the Tree of Life map of the seven subplanes of the physical plane: 504 = 7×72. This property further reveals how the number characterises the *material* aspect of the Tree of Life. Indeed, it applies to any holistic system. For example, we saw in section 33 that, if the 50 faces of the five Platonic solids are divided into their 180 sectors, their 50 face-centres and 50 vertices are joined to the five polyhedral centres and all the resulting triangles are regarded as Type A, 504 geometrical elements on average surround the axis of a Platonic solid, creating its form. These examples serve to demonstrate that this number is one of the parameters of sacred geometries. Remarkably, it measures the distance in yards from Cone C to MP when measured along lines parallel to the vertical and horizontal arms of Nolan's Cross. It is equally remarkable that its factorisation 504 = 21×24

can be found in a world-famous, megalithic representation of God, as will be reported later by the author in a separate publication. However, this depiction is *three-fold*, so that the number 1512 (the length in feet of Nolan's Cross) can be found there as well as the number 504! Here is unambiguous evidence of the archetypal character of this number found in a different continent thousands of miles away.

The distance between Cone C and the Head Stone is five units, or 120 yds, and the distance, measured along the X and Y axes, between the latter and MP is 16 units, or 384 yds (Fig. 95). The 120:384 division of the sacred-geometrical parameter 504 is also found in the megalithic monument just mentioned, as it must be, for both represent the same archetypal pattern that expresses the three-, seven- and ten-fold nature of God. The number 10 determines the number 120 because it is the sum of the 10 odd integers after 1:

$$11^2 - 1 = 120 = 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21.$$

The number 384 is the sum of the squares of the first nine integers after 1, which end with 10:

$$384 = 2^2 + 3^2 + 4^2 + 5^2 + 6^2 + 7^2 + 8^2 + 9^2 + 10^2.$$

It is the number of lines and broken lines making up the 16 rows of eight trigrams in the 8×8 square array of 64 hexagrams used in the ancient Chinese system of divination known as I Ching. Notice that, just as the distance between the Head Stone and MP is 16 units, i.e., 16×24 yards, so each of the 16 sets of eight trigrams comprises 24 lines & broken lines, totalling 16×24 = 384 lines & broken lines. Moreover, MP is 16 units (384 yds) above Cone E at the foot of Nolan's Cross. The 5:16 division in this distance manifests in Nolan's Cross itself. The 21 units of distance surrounding its core segment, which extends between 168 and 192 yards up the vertical arm from its base, consist of five units (120 yds) extending along one arm and 16 units (384 yds) extending along the vertical arm and the other horizontal arm. *The length of Nolan's Cross outside its core is the distance (measured along the axes) from Cone C to MP!*

The archetypal 120:384 division of the number 504 exists in the very arithmetic that generates these numbers, as now explained. The total length of the cross is predicted to be 528 yds. As

$$528 = 23^2 - 1 = 3 + 5 + 7 + \ldots + 45,$$

$$24 = 5^2 - 1 = 3 + 5 + 7 + 9,$$

$$48 = 7^2 - 1 = 3 + 5 + 7 + 9 + 11 + 13$$

and

$$168 = 13^2 - 1 = 3 + 5 + \ldots + 25,$$

$$120 = 168 - 48 = 15 + 17 + \ldots + 25$$

and

$$504 = 528 - 24 = 11 + 13 + \ldots + 45 = 11 + 13 + 120 + 27 + \ldots + 45 = 120 + 384,$$

where

$$384 = 11 + 13 + 27 + \ldots + 45.$$

Therefore,

$$528 = 24 + 504 = 3 + 5 + 7 + 9 + 120 + 384.$$

This number is made up of the first four odd integers after 1 adding to 24, the six odd integers 15-25 adding to 120 and 12 odd integers adding to 384 (the first two odd integers adding to 24 and the last 10 adding to 360). This 4:6:12 pattern in the number 22, where 12 = 2 + 10, is present in Nolan's Cross as the four units of length between Cones D & E, the six units of length between Cone D and the Head Stone and the 12 units marked out by Cone A, the Head Stone, Cone B and Cone C, the Cone A-Head Stone distance being two units. We see that the lengths of the cross and its sections marked by boulders are *arithmetically* defined, being set by the 22 odd integers after 1 that add up to 528 and by their partial sums.

This division exists also in the inner form of the Tree of Life (Fig. 95). Outside the shared root edge of the (7+7) enfolded Type A polygons are 520 yods. They comprise 16 black yods that are part of the outer Tree and 504 yods that are unshared with it. The latter yods consist of 120 yods in the triangles, squares & pentagons and 384 yods in the hexagons, octagons, decagons & dodecagons. The first three types of polygons correspond to one arm of the cross and the last four types correspond to the rest of it. The 20 yods that either are shared with the outer Tree or make up the root edge correspond to the core segment. Its length of 24 yards correspond in the two separate sets of seven enfolded polygons to the 16 shared yods and the eight yods making up their root edges.

49. Explaining the discrepancies in distances

The measured total length between the fives cones marking out Nolan's Cross is 1587 ft, or 529 yds (see the right-hand diagram on page 1). This is three feet too long, according to the predicted length of 1584 ft (528 yds). It amounts to an error of about 0.19%. The length of the arms is 720 ft, which agrees exactly with prediction. The overall discrepancy resides in its vertical section, which is 867 ft, three feet longer than the predicted 864 ft. Can this and discrepancies in distances between the four boulders lying on this line be easily explained? There are two logically possible reasons:

1. Current distances refer to distances measured from the front of each boulder, whereas all the stones were originally placed by measuring from their "centres." As they are not spherical or even symmetrical, their centres are not really definable. Did the designers of the cross measure from the pointed top of each boulder (hence its cone-shape), whereas the landowner Fred Nolan made all his measurements from the front of them? As the boulders are several yards wide, differences in how measurements were made would account for discrepancies. However, it cannot be the whole story, because it would imply that all currently measured distances are less than what the designers of the cross intended, whereas the Cone A-Head Stone distance is one foot too long and the Cone D-Cone E distance is five feet too long Therefore, there has to be another reason that resolves this inconsistency;
2. Before landowner Fred Nolan realised that the formation of boulders that he found on his property formed the shape of a cross, he is known to have moved several boulders to see if anything was buried underneath them. William Crooker's book *Oak Island Gold* gives an account from a man named John O'Keefe about the discovery of a wrought iron stove excavated under Cone B on Oak Island:

> *"There is an interesting quote taken from "Oak Island Gold, page 178", where it mentions how several boulders were moved, before it was understood that they were part of the large megalithic "Christian Cross."*
>
> *"There's a big rock up there in the field, a great big boulder. We took the bulldozer and the backhoe, rolled it over and out of the way and there underneath were pieces of an old wrought iron stove... How it ever got down there is beyond me... Fred was really surprised, and we kept digging and digging and found other pieces of stuff there, too, like knives and forks. I don't know how a big rock ever got on top of all that. Why would someone go to all the trouble of digging a hole, burying all that stuff and then rolling a big rock like that over it? It just doesn't make any sense."*

We do not know how many boulders got moved, or whether they were rolled back in place. As Nolan did not know at the time that they were not only part of a cross but might provide a clue to the whereabouts of buried treasure, he had no motive to return them to their original spot, so that some at least might not now be on their original spots. This is what this article indicates. The Head Stone-Cone E distance should be 720 ft, not 722 ft. Cone E must have been moved down two feet. But the Cone D-Cone E distance is 293 ft, not the predicted 288 ft. Therefore, Cone D must have been moved upwards by three feet. Cone A was moved permanently one foot away from the Head Stone, which could not have been moved *permanently* from its correct position because its distance from either Cone B or Cone C would no longer have been the same as its predicted distance of 360 ft. Although Cone B *was* moved, it must have been moved back, otherwise its measured distance from Cone C would no longer be *exactly* the predicted 720 ft.

There is, of course, a third possibility, namely, that the builders deliberately placed one or more boulders a foot or so away from where they were supposed to go in order to prevent treasure hunters from using the clues that Nolan's Cross contains to the whereabouts of the MP — that is, unless they could discern the true sacred numbers that the distances represented and the true sacred geometry that they marked out. This might have been their way of guaranteeing that only those who had arcane knowledge of God's cosmic design and were worthy of access to their buried wealth would be able to find it by recognising the underlying layout that had been intended. Although this scenario cannot be ruled out, the movement by Fred Nolan of some stones by a few feet and his not bothering to put them back in the same position seems to be the more plausible reason for the discrepancies; certainly, it is enough reason for their existence. Whatever their origin, the crucial point is that, being both small and explainable in a consistent way, these differences do not present a problem for the explanations presented in this article. If their size had been, say, as large as twenty feet, then the situation would be more problematic, as Nolan would not have moved boulders weighing several tons as far as that merely to investigate whether anything was buried in the soil underneath them.

50. A clarification

An important point needs to be made concerning what the author claims the material of this article proves and what it does *not* imply.

The fact, demonstrated in these sections, that the numbers marked out by the boulders in Nolan's Cross conform to a universal pattern that exists in sacred geometries depicting God has various implications that need serious consideration. However, the reader should not conclude that these correlations mean that the designers of the cross knew all the mathematical details revealed here about the Tree of Life, its inner form that the author discovered, and its isomorphism with the Sri Yantra and the 64 hexagrams. To make that inference is a mistake because it misunderstands the author's motive for drawing so many correlations in such detail. The crucial point is that these isomorphisms can be revealed — it cannot be denied that they exist! The author is *not* claiming that whoever built Nolan's Cross, the Money Pit, etc knew all about them and allowed their knowledge of the mathematical design of the spiritual cosmos to influence their shaping the cross. Certainly, people like the Knights Templars (or, more likely, their leaders) would have absorbed the mystical knowledge of the Jews and other cultures when they travelled around the Holy Land. It is, therefore, not surprising that Kabbalistic ideas like the 22 letters of the Hebrew alphabet and the 72 Names of God manifest so explicitly in the dimensions of Nolan's Cross, whose predicted total length of 22×72 ft cannot be a coincidence, being a mere yard less than the value measured after Nolan moved some of the boulders. The author is not assembling a bundle of unproven speculations or making wild claims that the designers of the cross knew about modern theoretical physics because the group theory of superstrings can be identified in its dimensions. He is not claiming that the cross designers knew Pythagorean number mysticism or how the tetractys is the Rosetta Stone that deciphers fundamental knowledge about reality embodied in sacred geometries. All he is asserting is that such amazing connections to mathematical ideas that emerged only four or five centuries later should be expected if these people had some degree of mystical insight and knowledge of the Perennial Philosophy. Why should it be so hard to accept the mathematical coherence of the correlations made in this article? Surely, it has to exist if the designers really *had* tapped into this universal wisdom. The problem, of course, is that the modern scholar or scientist (or many of them, at least) always finds it too difficult to accept that someone may acquire an understanding of God and the universe that is similar in many details to that found in countries he has never visited thousands of miles away without even reading books about their analogous doctrines or meeting their inhabitants. For him, the cause of the similarity (or even identity) in content must be external, taking the form of books, teaching or travel. It can never be internal, for such an attribution must be conjectural, requiring religious or metaphysical belief, which the scholar or scientist thinks has no place in his work. After all, although he may regard Plato as a great thinker, he still will not openly admit to accepting that the archetypal world of *nous* exists.

In conclusion, what this article claims is *not* that people with knowledge of the Sri Yantra, Kabbalah, Pythagorean mathematics and Taoism visited Oak Island and made a cross whose size and proportions was determined solely by this knowledge, for most would find this hard to believe, given that they lived some time during the Middle Ages, when little about eastern religions had reached the West. Rather, the article proposes that these people possessed genuine insight into the Perennial Philosophy, one that was sufficiently advanced in its mathematical expression to reproduce the *same* quantitative relationships as those expressed in these sacred geometries. If a "divine wisdom" or *theosophia* truly exists, inspiring the esoteric core of all religions, why should it be impossible that a small island off the coast of Nova Scotia displays the work of people who seemed to have encountered it through mystical revelation and regarded their treasure sacred enough to deserve being buried at a place that was determined by divine principles? It was pointed out in Section 14 that the yod population of the outer & inner Tree of Life is equal to the length in feet of Nolan's Cross. Is that just a miraculous coincidence? If not (for — like miracles — it seems too improbable), does it mean that the cross was marked out partly in order to have this specific property? Did its builders know about the remarkable, geometrical object the author calls the "inner form" of the Tree of Life? Not necessarily, for the simple reason that, if one incorporates into an object a pattern of "sacred numbers" that is part of the divine paradigm, as Plato did with the lambda-shaped sequence of seven numbers that he proposed the Demiurge used to create the celestial and planetary spheres, then this pattern *must* be consistent with the rest of the mathematical paradigm, about which one may be still ignorant. The part will still fit into the whole like pieces of a jigsaw puzzle even though only a fragment of the complete picture was known. Deeper, mathematical connections with other pieces will exist and can be revealed by research, irrespective of whether they were ever consciously known at the time. Such pervasive harmony is what this article has intended to demonstrate; it has *not* meant to present some theory about Nolan's Cross that cannot be tested because it makes no predictions. There is no rational explanation for this harmony other than that esoteric knowledge belonging to the Perennial Philosophy was used in the construction of Nolan's Cross. It was never merely a cryptic clue to the whereabouts of buried treasure, for it can now be understood as *a form of treasure in its own right*.

51. Conclusion & acknowledgements

Nolan's Cross is a representation not of the *shape* of the Kabbalistic Tree of Life (or some part of it), as some people have surmised, but of certain archetypal numbers with religious and scientific significance that parameterise both its outer and inner forms. The latter (discovered by the author) is a geometrical structure that is implicit in the former, encoding its replication, just as the DNA molecules in the nucleus of a biological cell control its growth and reproduction. Indeed, the author's research reveals that these numbers, likewise, parameterise the sacred geometries found in various religions because they are all isomorphic to these two complementary, fundamental forms. The numbers have meanings that are far more profound than merely quantifying lengths of lines, which are not Paths of the Tree of Life. They are also too numerous and appear too often in the analysis of well-known sacred geometries for it to be plausible that their presence could arise just by chance. For example, it cannot be mere coincidence that:

- the total length (528) in yards of the cross is the sum of the first 22 odd integers after 1, given that the Tree of Life has 22 Paths to which the 22 letters of the Hebrew alphabet are assigned. This is further indicated by the fact that the two separate halves of the inner Tree of Life have 528 yods;
- their total length (1584) in feet is the sum of the numbers of yods in the outer & inner Trees of Life;
- their total length in fathoms (264) is the number of yods in each half of the inner Tree of Life;
- the 10:12 ratio of the lengths of the vertical section up to the Head Stone and the remainder of the cross corresponds to the 10 Paths making up the trunk of the Tree of Life and to the 12 Paths in its branches; it also corresponds to the 120 (=10×12) yods lining the seven enfolded, Type A polygons of each half of the inner Tree of Life and the 144 (=12×12) yods that are inside them. Moreover, as

  $$528 = 23^2 - 1 = 3 + 5 + 7 + \ldots + 45 = \text{sum of 22 odd integers,}$$
  $$288 = 17^2 - 1 = 3 + 5 + 7 + \ldots + 33 = \text{sum of 16 odd integers}$$

  and

  $$48 = 7^2 - 1 = 3 + 5 + 7 + 9 + 11 + 13 = \text{sum of six odd integers,}$$

  it follows that 528 = 288 + 240, where 288 = 240 + 48 and the 22 odd integers after 1 consist of the 10 odd integers 15-33 adding to 240 and the 12 odd integers summing to 288 that make up the number 48 and the second 240. In other words, 10 odd integers determine the distance of 240 yds between the Head Stone and Cone E and 12 odd integers determine the distance 48 yds between Cone A and the Head Stone and the distance of 240 yds between Cone B and Cone C. The *same* 10:12 division as that which shapes the cross reappears in the numbers of odd integers adding to the lengths of its horizontal and vertical sections;
- the equal lengths (720 ft) of the horizontal arms and the vertical section below the former corresponds to the 720 yods that surround the centres of the seven separate, Type B polygons making up each half of the inner Tree of Life;
- the (240+240) yards in these two lines correspond to the (240+240) hexagonal yods in the (7+7) Type A polygons. Their counterpart in $E_8 \times E_8'$ heterotic superstring theory are the (240+240) roots of the two identical, rank-8, exceptional Lie groups E_8 and E_8';
- Cone D divides the length (720 ft) of the vertical section below the horizontal line into lengths of 288 ft and 432 ft, just as the 288 yods surrounding the centres of the seven separate Type A polygons in the inner form of the Tree of Life increase by 432 yods to 720 yods when the polygons become Type B;
- the arithmetic mean (72) of the first four integers raised to the powers of themselves is the natural unit of length that turns the lengths of all sections of the cross into integers ranging from 1 to 12;

and so on …….

As it is too implausible to believe that all this evidence of mathematical *design* and *isomorphism* with both the outer/inner Trees of Life and the Sri Yantra is the result of chance, we have no alternative but to accept that the designers of Nolan's Cross on Oak Island were intent on a far grander project than providing cryptic clues to the location of treasure that they had buried, although this was no doubt part of their purpose. They knew that only someone who had *their* degree of insight into knowledge of the Divine (not the sort found in published books but wisdom revealed by genuine, mystical insight) would be able to recognise the significance of what they expressed so simply with five or six heavy boulders that they had carefully laid out. It is possible that additional stones or boulders, now buried or removed, were used. If some still do exist at the site, they should lie hidden *on* the lines of the cross formed by the boulders or the rectangle enclosing it, not further away from the formation, as any off-line location would make no sense in the context of the correlations made in this article with both the outer and inner forms of the Tree of Life, the symmetry group of a superstring theory and its representation in eight-dimensional space by the 4_{21} polytope. Those who speculate that some of the boulders marking various Sephiroth of the Tree of Life that they think the cross is part of are buried or were moved away should ask themselves how it would make sense to build such a distorted version of the Tree of Life. Cones B and C are too far apart compared with the distance of Cone A from the Head Stone for the former to lie on the side Pillars of an

incomplete Tree of Life and for the latter to lie on the central Pillar of Equilibrium. As this article proves, it was the *magnitude* of the measured distances between boulders and their *relative proportions* that counted, not, merely, the *shape* of a Jewish, mystical icon that some people believe the builders marked out at least partially. Fig. 63 provides the proof of that, for it is undeniable that the lengths marked out by the stones in units of 72 ft are the *numbers* of straight lines (Paths) making up the trunk and branches of the outer Tree of Life; it has no connection with the actual lengths of the Paths. That is why the proportions of the cross deviate significantly from that formed by certain Paths. Proponents of the distorted Tree of Life theory may wish to argue that the builders wanted Paths 12 and 15, when extended, to intersect at the Money Pit, and they had to distort the Tree of Life in order that the latter would be at a location where it was convenient to work. But this argument is weak, for it was, surely, not beyond their skills to design a smaller, accurately scaled Tree of Life that had this property. A sacred geometry that encoded the whereabout of the Money Pit could never be so recognizable that it could be readily deciphered. That is why Nolan's Cross is *not* traditional sacred geometry, not even a version of it distorted for practical convenience. Instead, it is a representation with simple lines of the mathematical pattern to be found in *all* sacred geometries, including the Tree of Life, as the author's work has proved. Their lengths represent whole numbers, and the boulders were located at spots that expressed some of these numbers as sums of other numbers integral to this pattern. Their lengths have be to integer multiples of some basic unit. The clues that were provided could not be purely visual, as any treasure hunter could then have easily read the signs. They had to be ones that could be understood only by those well versed in the arcane knowledge of Kabbalah, for only this precaution would guarantee that the sacred treasure would be found by people with the right, religious intentions concerning its use. At the same time, its custodians had to booby-trap the Money Pit in order to frustrate anyone who found its location by accident.

Perhaps, however, the real treasure to be found on Oak Island is not merely material. Maybe it is the Nolan Cross geometry itself, for, as this article shows, it is isomorphic to the cosmic blueprint that determines the nature of all levels of reality. How could this have been known to the designers of Nolan's Cross? They were possibly *not* its actual builders, who managed to sail across the Atlantic Ocean, carrying the plans of others, as well as much fabled treasure. The universal, conceptual scheme depicting the spiritual cosmos could have been known to these people still hidden from history because it is an integral part of the "perennial philosophy," or divine wisdom (*theosophia*) belonging to esoteric traditions within religions — knowledge that secret societies, etc have guarded for many centuries and whose mathematical beauty this article has partly unveiled. Whether they knew the specific Kabbalistic form that the map of the spiritual cosmos takes is uncertain. But it is an academic issue. The crucial point is that Nolan's Cross was designed according to genuine, mystical insight because its features match those found in the esoteric teachings of major religions.

Acknowledgements
I thank Brian Pharoah, author of "The Secrets of Nolan's Cross," for kindling my interest in the mystery of Nolan's Cross, about which I had not previously heard. He pointed out that the numbers measuring its various sections are sacred numbers found in the world's ancient religions. This article is a condensed summary (essentially, a list of research results) of my preliminary investigations from a (mainly) Kabbalistic perspective into the reason for their appearance. These numbers measure the layout of the cross and certain straight lines surrounding it not merely because the builders regarded them as sacred and thought it appropriate to scale a religious icon according to their magnitudes. Mathematical necessity *forces* these numbers to be there in the observed pattern because they are mathematically related parameters of a *universal blueprint* governing the cosmos (both physical and superphysical) that the author has found in the sacred geometries of these religions (for details, please see his book "The Mathematical Connection Between Religion and Science," Antony Rowe Publishing, UK, 2009). Nolan's Cross depicts only some of the various patterns of numbers present in it. What is unique about it as a representation of holistic systems is its *minimal* quality, achieving with just a few, straight lines of carefully chosen length what sacred geometries of various ancient religions depict in a more complex way. Does the author's analysis confirm the suspected location where treasure is buried? Yes. Most researchers into the mystery of Oak Island suspect that Nolan's Cross provides the clue to the location of what has been buried there; this article confirms their belief. However, extrapolating a few straight lines connecting its cones and finding that their point of convergence is the area of the Money Pit is not very convincing, for no theoretical reason has ever been given for why the designers of the cross intended a certain pair of lines leading to the suspected spot to be chosen. Why did they bother to mark out such a large cross if a smaller one could have provided lines connecting cones that intersected at the *same* location? Clearly, its *absolute* size (i.e., the various distances between its cones) was just as important to them as its relative proportions and orientation; this article has explained why this is. It has deliberately focussed not on how the cross encodes the location of the treasure site (that issue was dealt with in the last few pages) but on why its shape and size were determined, for they were *not* solely to provide the vital clue to this problem.

Only when one understands how the designers thought can one comprehend the extraordinary connection between Nolan's Cross and the Money Pit that they intended. If it was *religious* treasure that was being buried, the clues to its whereabouts had to be given a proper, religious context — one sufficiently arcane that only those with the right motives would be able to find it. Some will argue that the architects of the geometry underlying Nolan's Cross and the Greater Rectangle could not have known about the Tree of Life because a diagram showing the 22 Paths and their association with the 22 Hebrew letters only appeared between 1652 and 1654, when Athanasius Kircher published his own version of the Tree in his *Oedipus Aegyptiacus;* this is much *later* than when most researchers into the mystery of Oak Island believe the treasure was buried there. (Johann Reuchlin had designed a diagram of the Tree for a book in 1516, but it depicted only 17 Paths). However, this criticism misses the point. The designers of the cross did not need to know about the Tree of Life *as it is known now* because their knowledge stemmed from the Perennial Philosophy, of which Kabbalah is only its western expression. It cannot be assumed that they were influenced solely by Kabbalah, let alone what its teachings were during the time when they lived. Their understanding was based not on a different Tree of Life but on details of the Perennial Philosophy that were necessarily consistent with the modern version. The point also needs to be made that what was known secretly but never published can precede by many years when history tells us someone first revealed it to the world. As any researcher knows, the date of publication of a great idea or discovery does not always accurately tell us about when it first occurred to someone; all it might indicate is when some other person proclaimed mistakenly to regard it as his own and decided to share it with others.