

The Ultimate Assertion:

בראשית ברא אלהים את השמים ואת הארץ : והארץ

Evidence of Supernatural Design in the Divine Prologue

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ABSTRACT

Some alternative views of Genesis 1:1 that explain why this first verse of the Hebrew Scriptures must be regarded as the most remarkable combination of words ever written.

SOME PRELIMINARIES

(1) The term **characteristic value** will be found to occur frequently in the following pages. It refers to a numerical attribute of **every** Hebrew word, or group of words, that has its origin in **the alphabetic scheme of numeration** introduced into Jewish society circa 200 BC. This is given in Table 1 where the Hebrew alphabet of 22 letters — five with **end-forms** — is presented as a set of numerals.

The practice then was to record numbers on an **additive basis**, that is, letter-values were simply added together to obtain the number represented by a group of characters. It is in this manner that the **characteristic values** are calculated.

(2) In an appropriate example of this procedure the derivation of the characteristic values of **the eight opening words** of the Bible is explained in Table 2. Reading from **right to left**, the eight numbers bracketed beneath the text are obtained by adding together

Position in alphabet	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Letter	א	ב	ג	ד	ה	ו	ז	ח	ט	י	כ	ל	מ	נ	ס	ע	פ	צ	ק	ר	ש	ת
Numerical Value	1	2	3	4	5	6	7	8	9	10	20	30	40	50	60	70	80	90	100	200	300	400

Table 1. The basis of the Hebrew alphabetic scheme of numeration.

(90)(200)(1)(5)(6)	(90)(200)(1)(5)	(400)(1)(6)	(40)(10)(40)(300)(5)	(400)(1)	(40)(10)(5)(30)(1)	(1)(200)(2)	(400)(10)(300)(1)(200)(2)
והארץ	הארץ	ואת	את השמים	-	אלהים	ברא	בראשית
EARTH THE AND	EARTH THE	AND	HEAVEN THE	-	GOD	CREATED	BEGINNING THE IN
(302)	(296)	(407)	(395)	(401)	(86)	(203)	(913)

Table 2. Derivation of the characteristic values of the eight opening words of the Bible, the first seven words making up Genesis 1:1.

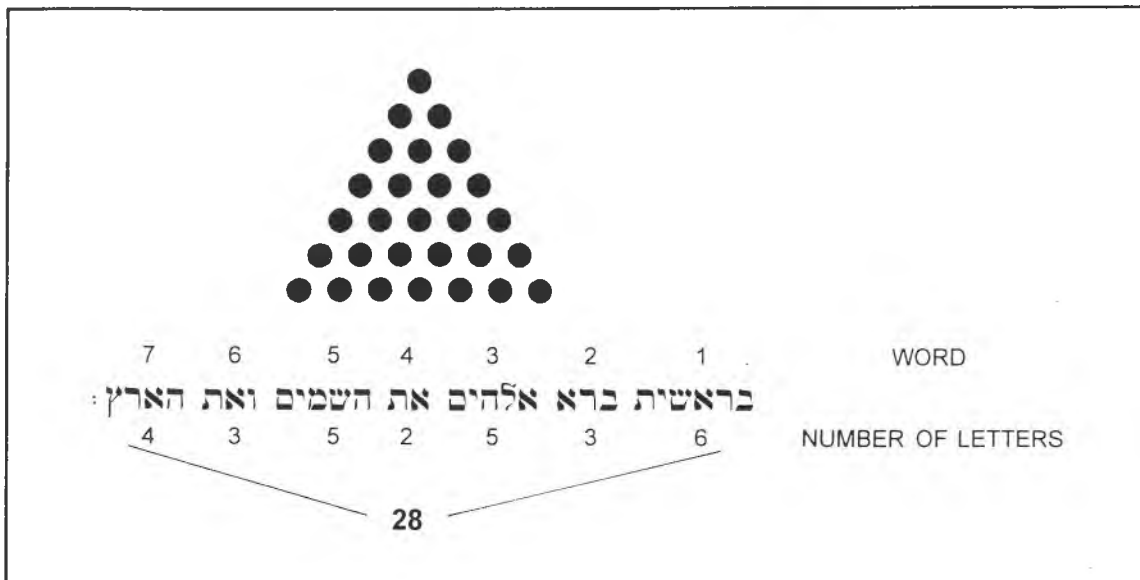


Figure 1. Analysis of the seven words in Genesis 1:1 reveals 28 letters therein.

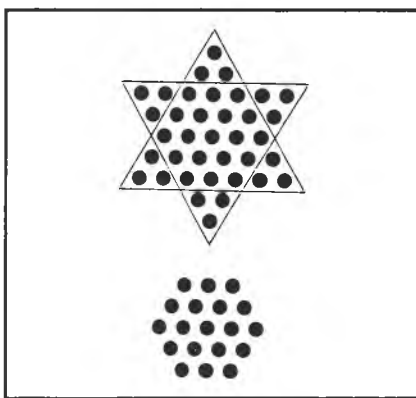


Figure 2. The hexagram (above) and hexagon (below) depicting their associated numbers.

the letter-values detailed above. The untranslatable fourth word is formed from the first and last letters of the alphabet — **Aleph** and **Tau**; its presence is necessary to sustain the grammar of the verse.

- (3) The **figurate number structures** portrayed in the following pages are readily — though perhaps, tediously — built from **coins of the same denomination**, or **sugar cubes**, used as counters as appropriate. Experience of this kind will boost confidence in the reality of the phenomena described — and of their implications.
- (4) Access to an **electronic calculator** — though desirable — is not essential.

EXAMPLES OF NUMERICAL SYMMETRY IN THE DIVINE PROLOGUE

Attached to the opening words of the Bible, as though by some divine superglue, is a structure of pure number

that is rooted in the heart of mathematics. However, this is not to say that it is inaccessible to the average person; on the contrary, it is open to all who have an eye for symmetry, and are able to count — and most possess these modest qualifications! Twelve of its principal features are presented here.

1. Absolute¹ Symmetry in the Lexical Structure of Genesis 1:1

From Figure 1 we see that:—

- (a) these seven words contain 28 letters;
- (b) 28 is the seventh **triangular number**² — the sum of the numbers named when counting to seven (that is, $1 + 2 + 3 + 4 + 5 + 6 + 7 = 28$);
- (c) the peripheral counters (that is, those forming the outline of this triangle) total 18, or $6 + 6 + 6$;
- (d) the first word has six letters;
- (e) 6 is the third triangular number;
- (f) 6 and 28 are, respectively, first and second **perfect numbers**;³ and
- (g) as a triangle, 28 is capable of uniting with an inverted copy of itself⁴ to produce the symmetrical Star of David, or **hexagram number, 37** — the overlapped counters forming the **hexagon number, 19**.⁵ (See Figure 2.)

The significance of these features will become apparent as we proceed.

2. Absolute Symmetry in the Characteristic Value of Genesis 1:1

In Figure 3 we find that:—

- (a) the total of the characteristic values of the seven words is 2701;
- (b) 2701 is the 73rd **triangular number** — the sum of the numbers named when counting to 73;

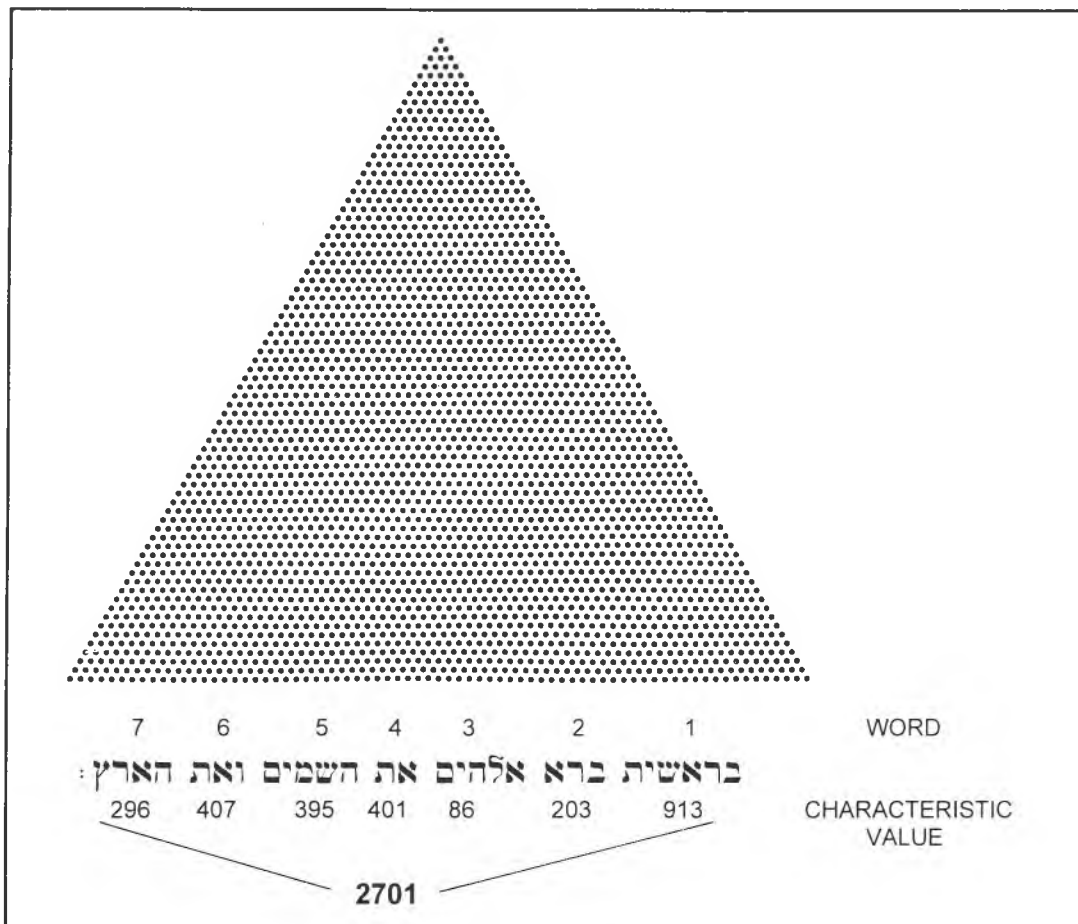


Figure 3. Analysis of the characteristic values of the seven words in Genesis 1:1 (obtained from Table 2).

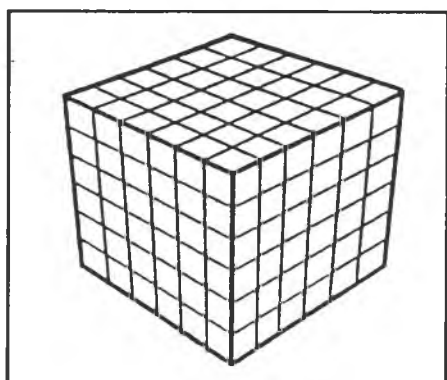


Figure 4. A cube built from 216 (6 x 6 x 6) unit cubes confirming 216 as a cubic number.

(c) its peripheral counters total 216, or 6 x 6 x 6; thus 216 is a cubic number,⁶ and unique, because among the cubes it is the only one whose volume is numerically the same as its surface area. This fact is perhaps best conveyed by substituting **unit cubes** for the 216 **circular counters**, and stacking these as depicted in Figure 4.⁷

3. Decimal⁸ Symmetry in the Factors of 2701

We can see that:-

- (a) $2701 = 37 \times 73$,
that is, ‘three tens plus seven times seven tens plus three’;⁹
- (b) both 37 and 73 are **prime** numbers, that is, they cannot be expressed as products of smaller numbers.

4. Absolute Symmetry and Association in the Factors of 2701

It can be shown that:-

- (a) 37 is a **trifigurate** number, that is, it displays **three** distinct symmetrical forms.¹⁰ Two of these are depicted in Figure 5, and shown to be associated with 73-as-hexagram, thus
 - (i) 37-as-hexagon (see Figure 5a) unites with the symmetrical ring of six triangles of six counters each (see Figure 5b) to yield 73-as-hexagram (see Figure 5c) — a picture which is highly symbolic of the **6/7 motif** of the creation narrative that follows this verse (that is, six days of creation in a week of seven days); and
 - (ii) a completely independent liaison involves 37-as-

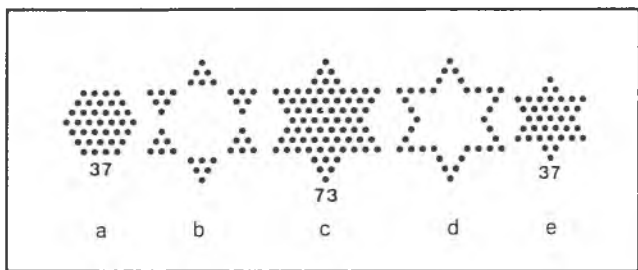


Figure 5. The absolute symmetry and association in 37 and 73, the factors of 2701.

hexagram (see Figure 5e) and the **outline hexagram garland** of 36 (see Figure 5d).

(b) 36 is itself a **bifurcate** number, displaying both **square** and **triangular** symmetry (see Figure 6).

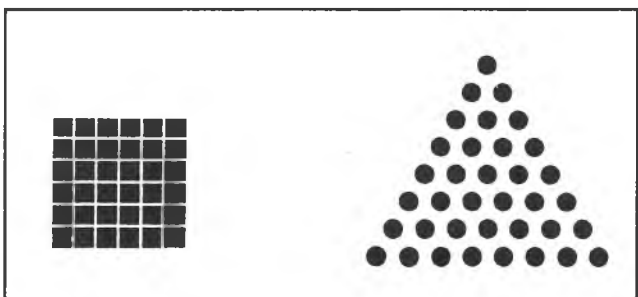


Figure 6. The square and triangular symmetries that reveal 36 to be a bifurcate number.

5. Absolute Symmetry in the Characteristic Value of Words 6 and 7¹¹

Here we see:—

- (a) the characteristic value of this two-word sequence (from Table 2) is 703; and
- (b) 703 is the 37th **triangular number** — the sum of the numbers named when counting to 37 (see Figure 7).

6. Absolute Symmetry and Association in the Factors of 703

It can be shown that:—

- (a) $703 = 19 \times 37$ — both prime numbers;
- (b) 19-as-hexagon (see Figure 8c) unites with the symmetrical ring of six triangles of three counters each (see Figure 8b) to yield 37-as-hexagram (see Figure 8a), this again appearing to anticipate the 6/7 principle of the creation; and
- (c) the same, augmented by the outline hexagon garland (see Figure 8d), yields 37-as-hexagon (Figure 8e).

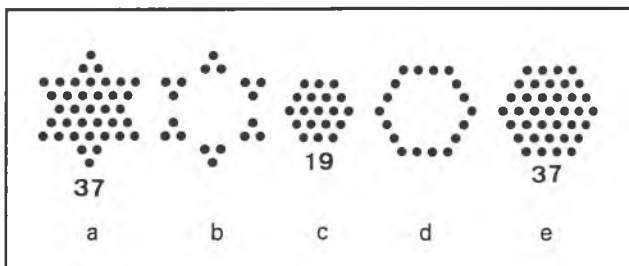


Figure 8. The absolute symmetry and association in 19 and 37, the factors of 703.

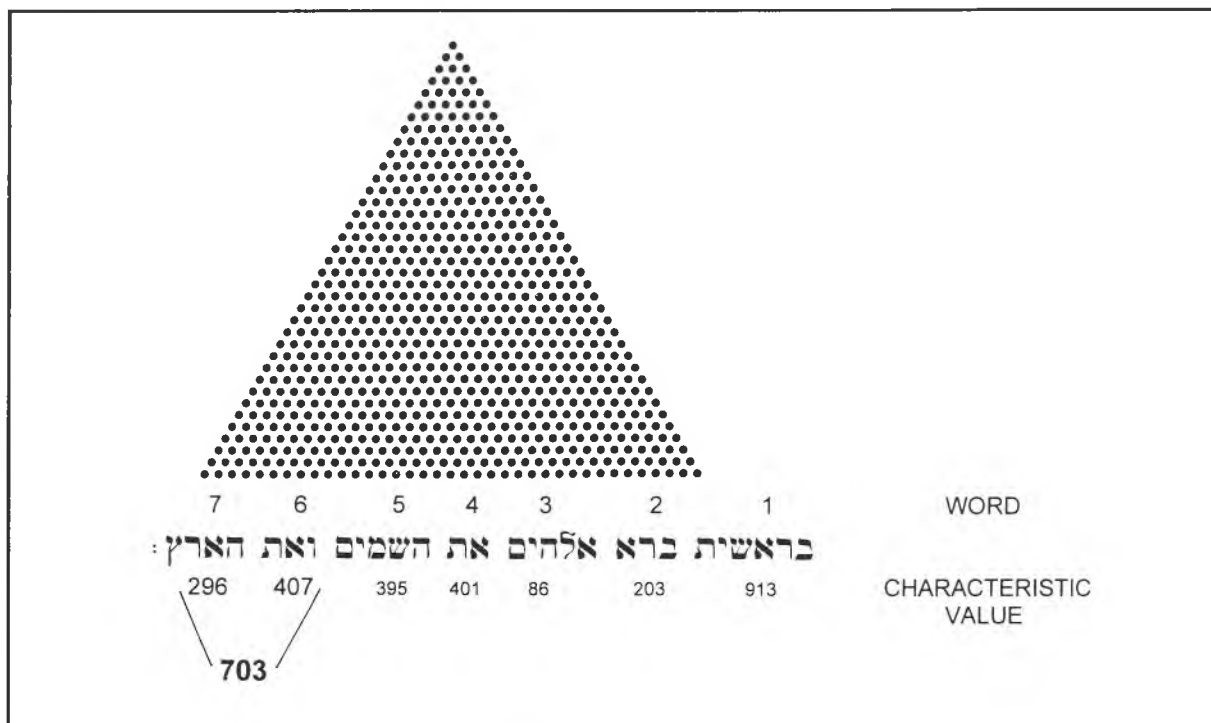


Figure 7. Analysis of the summed characteristic values of words 6 and 7 in Genesis 1:1.

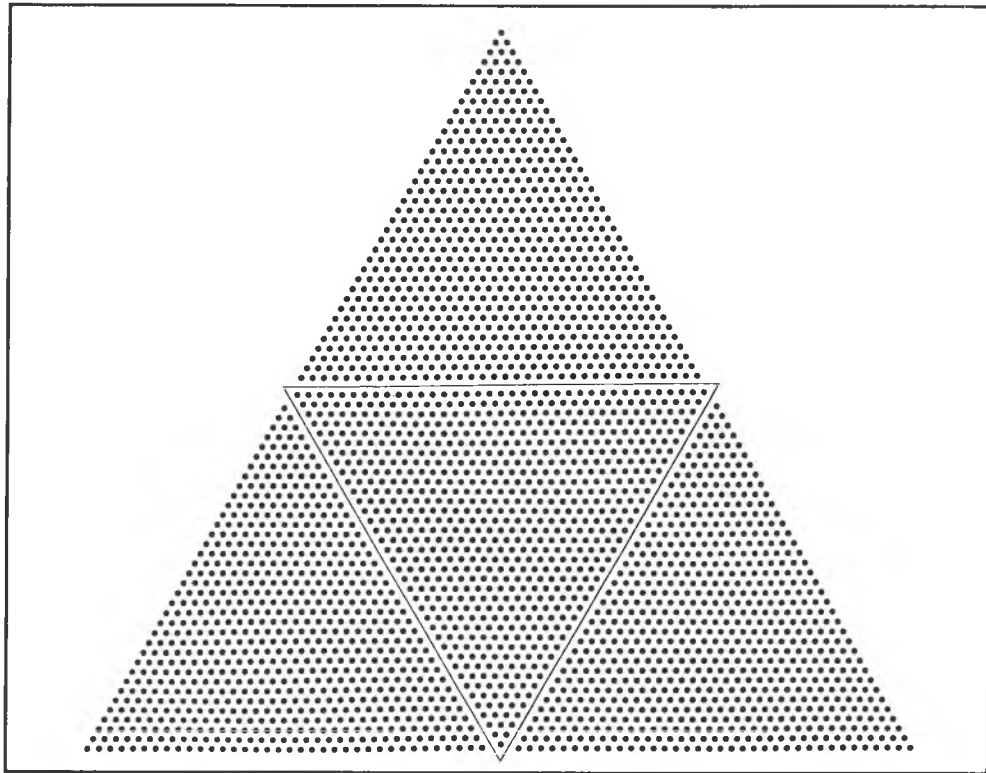


Figure 9. Symmetry and symbolism produced when the 37th triangle (703) is fitted precisely into the 73rd triangle (2701).

7. Symmetry and Symbolism involving the 37th and 73rd Triangles

It can be seen that:-

- (a) when inverted, 703-as-triangle fits precisely into 2701-as-triangle (see Figure 9);
- (b) in the process, it divides the remaining 1998 counters

into three groups of 666 — the 36th triangular number; and

- (c) viewed symbolically as an **arrowhead**, the downward-pointing inner triangle is very suggestive of a world opposed to God — the trio of 666s disappearing when it is turned to point up.

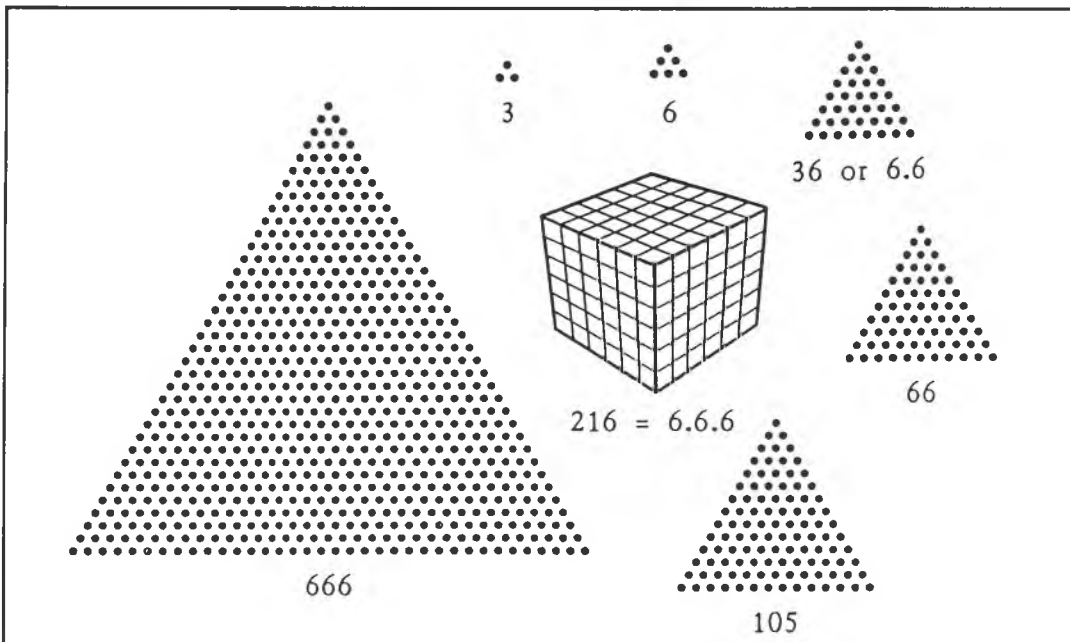


Figure 10. The triangular figurate attributes of the unique number 666 and the unique cube formed from 216, the sum of these attributes.

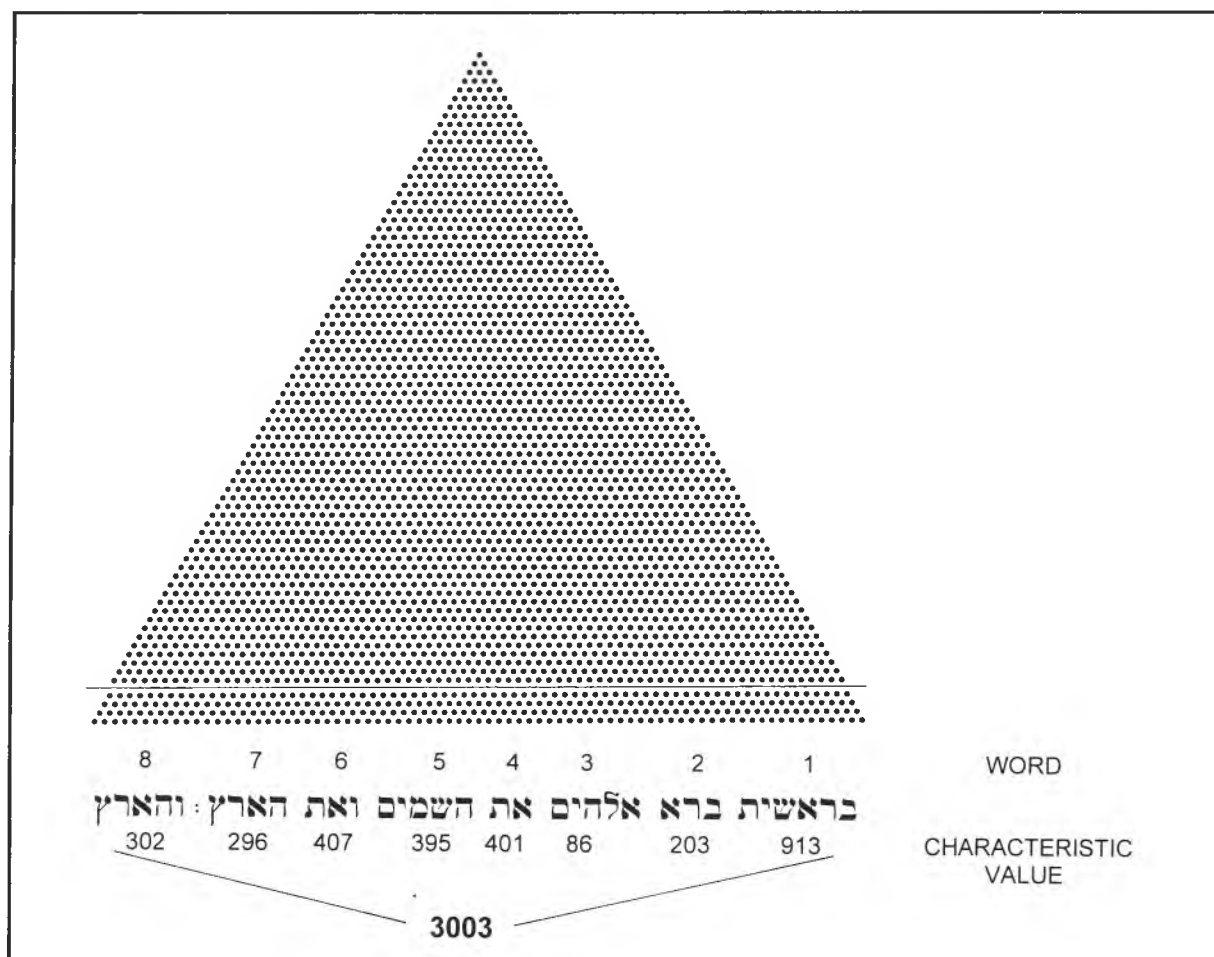


Figure 11. The triangular form of 2701 — the sum of the characteristic values of words 1–7 (Genesis 1:1) — is here shown extended by four rows following the addition of the characteristic value of word 8, which therefore appears to function as a plinth for Genesis 1:1.

8. Decimal Symmetry, Absolute Symmetry and Uniqueness in the Triangle of Triangles, 666

Here we see that:–

- (a) $666 = 18 \times 37 = (6 + 6 + 6) \times 37$;
- (b) 666 is the first **triangular multiple** of 37, the second and third being 703 and 2701;
- (c) 6, 6^2 , 66 and 666 form an unparalleled and eye-catching sequence of triangular numbers generated by the first perfect number;
- (d) 666 is a unique number because all its figurate attributes — absolute and decimal — are triangular (see Figure 10), thus:
 - (i) number of sides = 3 = second triangular number
 - (ii) repeated digit = 6 = third triangular number
 - (iii) counters forming a side = $6^2 = 36$ = eighth triangular number
 - (iv) substring of '666' = 66 = eleventh triangular number
 - (v) counters forming outline = 105 = fourteenth triangular number; and
- (e) the sum of these attributes is 216, or $6 \times 6 \times 6$, this being the unique cube (see Figure 10 again) found earlier to

be the outline of the Genesis 1:1 triangle.¹²

9. The Decimal Analogues of 666 in Genesis 1:1

Certain combinations of the characteristic values (from Table 2) display the same arresting appearance as '666'.¹³ Thus:

- (a) $913 + 86$ (that is, words 1 and 3) = **999**.
- (b) $203 + 401 + 395$ (that is, words 2, 4 and 5) = **999**;
- (c) $86 + 395 + 407$ (that is, words 3, 5 and 6) = **888**; and
- (d) $86 + 395 + 296$ (that is, words 3, 5 and 7) = **777**.

Here we find the three nouns, 'God', 'heaven', and 'earth' combining to form a number involving the writing of 7 three times — and equal to $3 \times 7 \times 37$.

10. A Plinth for Genesis 1:1

It can be shown that:–

- (a) the sum of the characteristic values (obtained from Table 2) of words 1 to 8, inclusive, is 3003 — a **palindromic number**;¹⁴
- (b) 3003 is the **77th triangular number** — the sum of the numbers named when counting to 77 (see Figure 11);
- (c) the eighth biblical word — the first of Genesis 1:2¹⁵ — therefore functions as a **plinth** or **underscore** — as though to elevate further and/or confirm the high status of Genesis 1:1.

11. Some Other Aspects of the Plinth

These are:–

- (a) the characteristic value of the five-word sequence, beginning at word 4, is 1801;¹⁶
- (b) 1801 is the **25th hexagon number** (see Figure 12); and
- (c) this hexagon is closely associated with the three **square numbers** 25, 49 and 144, thus:
 - (i) length of the hexagon’s side = **25** = 5 x 5
 - (ii) height, or number of rows = **49** = 7 x 7
 - (iii) perimeter, or outline = **144** = 12 x 12
and, since 5 + 7 = 12, 1801-as-hexagon is **unique**.¹⁷
 - (iv) 1801-as-hexagon is precisely compatible with 703 and 2701 — the 37th and 73rd triangles respectively (see Figure 13).

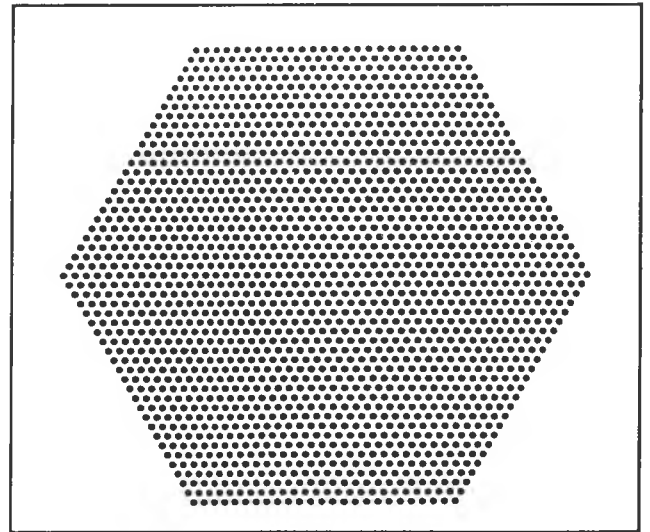


Figure 12. The hexagon formed from 1801 counters, 1801 being the 25th hexagon number.

12. Genesis 1:1 as a Hexagram of Hexagrams

It can be seen that:–

- (a) the compound Star of David presents a remarkable

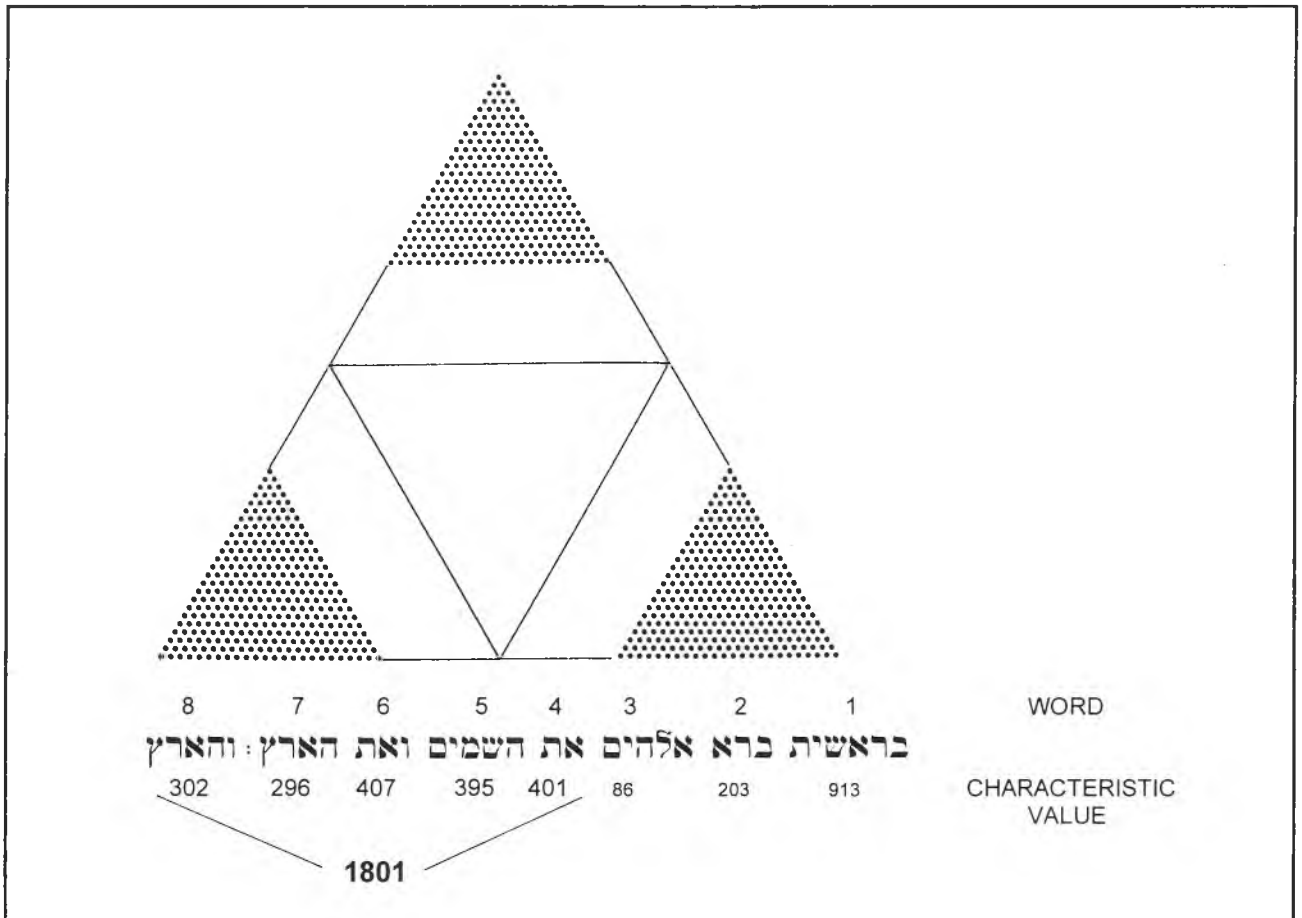


Figure 13. Analysis of the characteristic values (obtained from Table 2) of words 4–8. The 1801-as-hexagon (so derived) fits precisely within the 73rd triangle (2701), while the 37th triangle (703) fits precisely within the hexagon.

alternative view of the Bible's first verse as a symmetrical object — one that is based upon that fact that both its factors — 37 and 73 — are figurate hexagrams (see Figure 14); and

- (b) in an exploded view of the same star, 703 (that is, ' — and the earth. ') appears as the symmetrical hexagonal core of 19 elements, this being tightly embraced by a garland of 18 elements representing 666 (see Figure 15).¹⁸

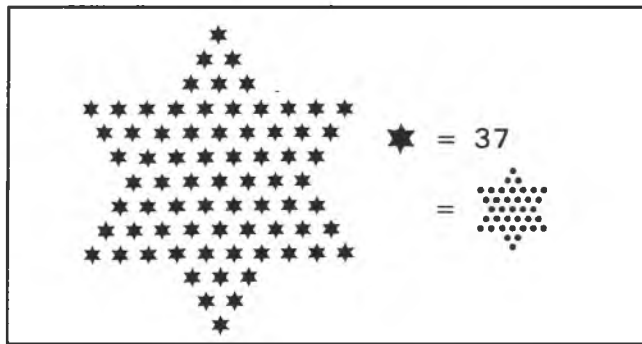


Figure 14. The compound Star of David (left) comprising 73 star counters — each representing 37-as-hexagram (right).

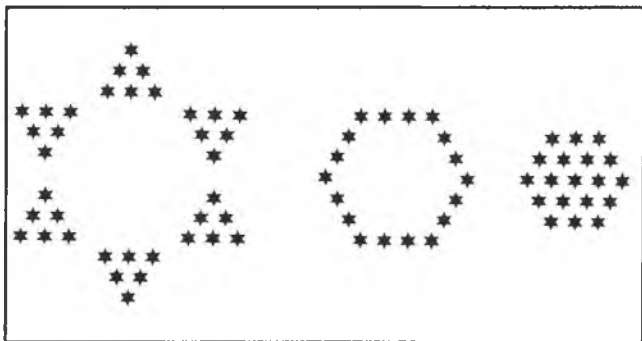


Figure 15. The symmetrical components of the same compound Star of David include (right) a hexagonal core of 19 counters (representing 19×37 , or 703) tightly embraced (centre) by an outline hexagon of 18 counters (representing 18×37 , or 666).

DISCUSSION

These facts speak for themselves: beyond all reasonable doubt they are an eloquent testimony of **skilful design** and **lofty purpose**. In order to facilitate the discussion, let us designate the author, 'A', and his motives, 'M'.

It is clear that A has caused a number of independent threads of symmetry, singularity and symbolism to converge in these eight words, in particular, those based upon (a) the lexical structure of words 1 to 7 — 'surface features' that cleverly hint at the 'hidden treasures' contained in this sequence (Section 1);

- (b) the figurate properties of 2701 and its factors, and involving the phenomena associated with the first three triangular multiples of 37 (Sections 2 to 9, and 12); and
- (c) the eighth word, and the resulting augmented verse (Sections 10 and 11).

A has linked these features visually by calling upon the simplest of all figurate numbers — **the triangle**.

It may be further observed that

- (a) the main attributes of Genesis 1:1 catalogued here derive from **running sequences** of words — a fact that should not be overlooked in any assessment of probabilities;
- (b) clear principles are established — particularly A's partiality for the **unique**, the **eye-catching** and the **symbolic**;
- (c) A's scheme of numerical design rests upon the firmest foundation known to man, namely, **mathematics** — revealing an awareness that there can be no better basis for an exercise of this kind;
- (d) remarkably, features that specifically belong to our present system of numeration appear to have been anticipated by A; and
- (e) A's scheme makes no great demands of the human intellect, and is open to — and, no doubt, intended for — a **wide audience**.

For those who will want to determine the identity of A, there is one further fact to consider: it is that A's words were recorded *many centuries before the invention of alphabetic numeration!* Such feats of anticipation, design, and execution surely extend far beyond the capabilities of mere mortals! Finally, for those who would go on to consider M — the purposes that might lie behind this display of A's exceptional abilities — the unique and strategic position these words occupy in a large and highly-controversial Book, their direct challenge to the many other ideas now abroad, and the fact that their numerical complement has only recently become more fully known, are essential starting points.

FOOTNOTES

1. Immutable — completely independent of time and place; not subject to human choice, whim, or manipulation.
2. The best known example occurs in the game of snooker where the 15 'reds' are arranged in tight triangular formation at the commencement of each frame.
3. A number is said to be **perfect** if it equals the sum of all numbers that exactly divide it. For example, **28** is perfect because $1 + 2 + 4 + 7 + 14 = 28$, and so is **6** because $1 + 2 + 3 = 6$. Such numbers are not common — there being only four in the range 1 to 30 million. They have attracted the attention of many of the world's greatest mathematicians.
4. A feature of only one in three triangular numbers.
5. This **hexagon/hexagram pair** are specifically the third members of a pair of infinite series. They are particularly significant in this analysis, as the following sections reveal.
6. It should be noted that of the 4471 triangular numbers in the range 1 to 10 million, only seven have perimeters that are cubic.
7. That the **cube** is a biblical symbol for holiness is clearly implied by 1 Kings 6:20 and Revelation 21:16.

8. Patterns may also be seen in the digits of numbers as we write them today. These will depend upon the choice of **radix**, or **collective unit** — in this case 10. Clearly, such symmetry is **not absolute** because it is based upon **human expediency**.
9. It will be observed that each of these components is significant biblically.
10. Its third form is octagonal. 37 is, without doubt, **the most symmetrical numerical object known**.
11. These words (both multiples of 37) translated ‘... and the earth.’, clearly refer to the natural or physical aspects of creation — aspects that involve **man**, in particular.
12. See Section 2.
13. This three-digit repetition is a feature of some multiples of 37.
14. It reads the same backwards or forwards.
15. And the first of the remainder of the Bible.
16. Remarkably, this number may also be obtained from the characteristic values of Genesis 1:1 by **deleting zeros** and adding, thus: $913 + 23 + 86 + 41 + 395 + 47 + 296 = 1801$; and it may be further noted that, in this process, the sum of words six and seven is reduced from 703 to 343, or $7 \times 7 \times 7$.
17. It should also be observed that 49 is a **sabbath of sabbaths**, and that 25 is precisely half **the jubilee period** (see Leviticus 25).
18. There is powerful symbolism here, as a reading of Revelation 13 will confirm.

APPENDIX — THE ATTENTION SEEKERS

The ‘pillars’ upon which the Genesis 1:1 phenomena rest, viz 37 and 91 (factors of 703 and 2701, and of 3003, respectively) — judged simply as numbers — are found to be related, and to possess high profiles. [Perhaps this should not surprise us, for everything that **A** has done seems designed to confound the skeptic and the disciple of chance!] The more prominent of these extra-biblical features are here presented in three groups: in the first we catalogue those properties that are absolute and completely independent of man; then, in the second, provide examples of the many eye-catching attributes of 37 and 91 — and of certain of their multiples — as decimal objects; and finally, suggest a scenario that emphasises the uniqueness of the numerical palette chosen by **A**.

Solid Foundations

- * Attention has already been drawn to the hexagon/hexagram series of figurate numbers (see Figures 5 and 8); here are some extracts from these series:

Order No. (n)	Hexagon (X_n)	Hexagram (Y_n)
2	7	13
3	19	37
4	37	73
6	91	181

Here we find both 37 and 91 (also, their radix-dependent digit-reversals, 73 and 19); further, $X_2 \times Y_2 = 91$ — an analogue of the Genesis 1:1 triangles, $X_3 \times Y_3 = 703$ and $X_4 \times Y_4 = 2701$ (see Figures 3 and 7).

- * 37 and 91 are unique among numbers in that, represent-

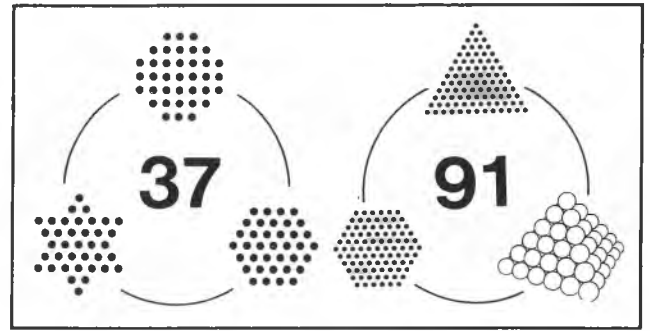


Figure A1. The three distinct symmetrical forms for 37 and 91 respectively.

ed by a collection of uniform circular or spherical counters, each can assume three distinct symmetrical forms (no other number is observed to possess more than two simple symmetrical forms) — as Figure A1 reveals. Clearly, 37 is 3rd hexagon, 4th hexagon, and 3rd octagon; and 91 is 13th triangle, 6th hexagon, and 6th pyramid.

- * 37 and 91 are based upon the difference and the sum of the same two adjacent cubes, thus:
 $4^3 - 3^3 = 37$; $4^3 + 3^3 = 91$; their arithmetic mean is 64 ($= 4^3 = 8^2$)
- * 37 is the first of a small subset of hexagrams each of which is also a hexagon. Here are the first three instances of the phenomenon:

Order No. (n)	Hexagon (X_n)	Hexagram (Y_n)
3	19	37
4	37	73
15	631	1261
21	1261	2521
85	21421	42841
120	42841	85681

The order numbers of these phenomena are in approximate G.P.¹ (common ratio ≈ 5.8); of the 40824 hexagrams in the first 10^{10} natural numbers there are only 6 such instances. In this company, 37 is distinguished by the fact that the equality occurs in adjacent positions in the series.

- * 37 is the arithmetic mean of 25 ($= 5^2$) and 49 ($= 7^2$). The interaction of these particular squares reveals a unique link with the classic example of Pythagoras’s Theorem — as Figure A2 reveals.
- * 91 is further distinguished by the fact that it is the only number that is both the sum and the difference of two adjacent cubes, thus:
 $4^3 + 3^3 = 6^3 - 5^3 = 91$

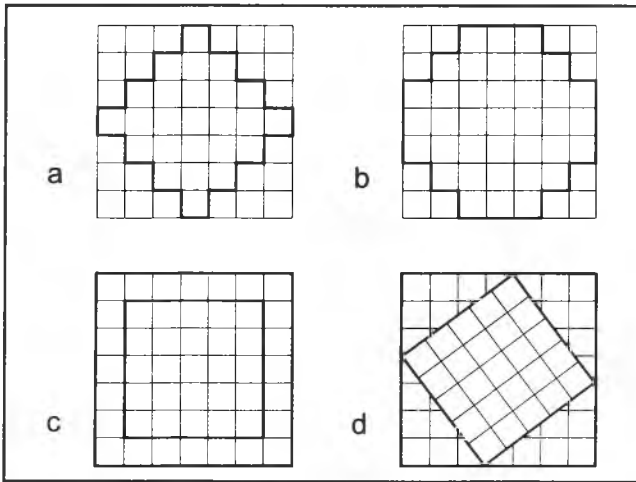


Figure A2. (a) A symmetrical diamond of 25 units set in a square array of 49 units.
 (b) A symmetrical octagon of 37 units set in the same square array.
 (c) A square array of 25 units set centrally in a square array of 49 units.
 (d) The same rotated within the larger square to yield four identical 3:4:5 right-angled triangles.

Curiosities and Recreations

The way we normally represent numbers involves the use of ten as a ‘collective unit’. Thus, the symbol ‘37’ really means ‘three tens plus seven’. It is instructive to reflect that had we been born with eight rather than ten digits on our two hands then thirty-seven would more than likely have been rendered ‘45’, that is, four eights plus five! By setting the collective unit — the ‘base’ or ‘radix’ — to eight instead of ten we see that the appearance of this number is now quite different though, of course, its absolute value remains unchanged. Choice of radix is an important matter in revealing further intriguing properties of the unique trifigurate, thirty-seven and ninety-one, and we find that there are many subtle links between these and ten — the universal radix and now the basis of all systems of physical measurement. These links also involve three which appear to function as a ‘catalyst’ in the proceedings.

* We begin by considering the short sequence of natural numbers, 999, 1000, 1001. Rewritten in factored form — $3^3 \times 37$, 10^3 , 11×91 — we observe the multiples of 37 and 91 sitting astride the cube of ten.

* 37 is the first of just three hexagons — each having a related hexagram that is its digit-reversal, thus:

Order No. (n)	Hexagon (X_n)	Hexagram (Y_n)
4	37	73
12	397	793
37	3997	7993

The triangular ‘spurs’ of the hexagrams comprise the unique finite series, 6, 66, 666 — which features the first perfect number, 6.

* Large multiples of 37 and 91 are easily discovered, as follows:

- Form groups of three digits from the right-hand end.
- Sum these (using filling zeros on the left, if necessary).
- If exactly divisible by 37, then so is the original number.
- Form a second sum, alternating the polarity of the groups.
- If exactly divisible by 91, then so is the original number.

For example, 8104369 is a multiple of by 37 and 91 because

$$(00)8 + 104 + 369 = 481 = 13 \times 37, \text{ and}$$

$$(00)8 - 104 + 369 = 273 = 3 \times 91$$

* Counting up to three and down again generates multiples of 37 in a variety of ways — these being associated with some gems of decimal symmetry, thus:

- $123 + 321 = 444 = 12 \times 37$, that is, three 4’s times 37

- $123321 = 3333 \times 37$, and we see four 3’s times 37

- $12321 = 111 \times 111 = 3 \times 37 \times 37 \times 3$

Extending these procedures to a count of six (that is, 2 x 3) we find

- $123456 + 654321 = 777777 = 7 \times 3003 \times 37$

(3003 being the 77th triangular number — see Figure 11).

- $123456654321 = 3336666333 \times 37$
 $= 1111111 \times 37 \times 3003$

- $12345654321 = 333666333 \times 37$
 $= 3 \times 37 \times 1002001 \times 37 \times 3$
 $= 37 \times 3003 \times 3003 \times 37$
 $= 111111 \times 111111$

The juxtaposition of 37 and 3003 (= 33 x 91) is a feature of these proceedings. Finally, the operations may be extended to incorporate the whole set of decimal digits as, for example:

$$0123456789876543210 = 1002003002001 \times 37 \times 37 \times 90$$

* Multiples of 37 comprising any number of three-digit groups may be rotated to yield further multiples of 37. For example, $259 = 7 \times 37$; $592 = 16 \times 37$; $925 = 25 \times 37$; $003219 = 87 \times 37$; $900321 = 24333 \times 37$; and so on.

* There are just four numbers that are related by the property that each is the sum of the cubes of its digits; they are 153, 370, 371, and 407. The second and fourth are multiples of 37 — the latter being, in addition, the characteristic value of the sixth word of Genesis 1:1. But the first and third also possess a biblical significance: the miraculous draught of fishes numbered 153 (John 21:11), and 153 is the 17th triangular number;

the duration of the Flood is calculated as 371 days (Genesis 7–8).

* The reciprocals of 37 and its digits, 3 and 7, are of considerable interest:

- $1/37 = 0.027027 \dots$, and we see the three-digit group '027' repeated ad infinitum; 27 is, of course, the cube of 3.
- $1/3 = 0.3333 \dots$, and we observe that a single three on the left generates an endless sequence of threes on the right; this feature links 3 with 10 in a particularly interesting way.
- $1/7 = 0.142857142857 \dots$, and here we find an endless repetition of the six-digit group '142857'; viewing this as a number in its own right, we find it to be rich in factors, thus:

$$142857 = 3^3 \times 11 \times 13 \times 37 = 999 \times 143 = 407 \times 351$$

Furthermore, all cyclic permutations of this number yield simple multiples of itself, thus:

142857	= S, say	= 1 x S
428571		= 3 x S
285714		= 2 x S
857142		= 6 x S
571428		= 4 x S
714285		= 5 x S

Again, the number formed by the multipliers of S, when read up or down, is a multiple of 37, and 758241 — the reverse of 142857 — is a rotatable multiple of 37!

* The reciprocal of 91 is related to the foregoing:—

- $1/91 = 0.010989010989 \dots$, and we have the repeated sequence '010989'; since $010989 = 3^3 \times 11 \times 37 = 11 \times 999 = 27 \times 407$ we here see further evidence of a denary linkage between the trifigures, 37 and 91.

Two cubic multiples of the same reciprocal are notable

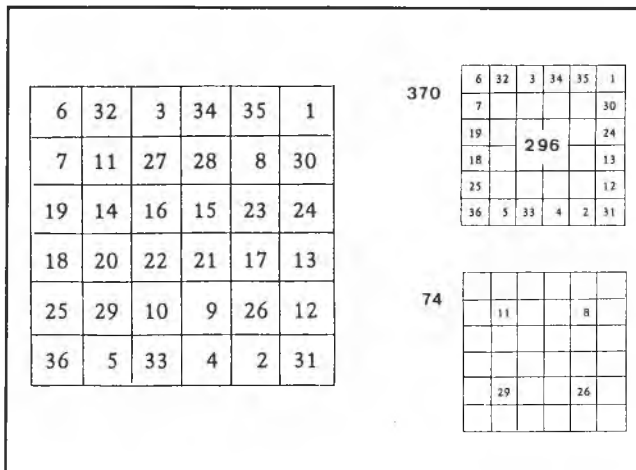


Figure A3. The square formation of the first 36 natural numbers (left) where the sum of any row, column or long diagonal is 111. The other features of this square formation are illustrated (right).

in that they reveal '296' and '703' in their complementary infinite sequences — 296 being the 7th characteristic value of Genesis 1:1, and 703 being the 37th triangular number, the sum of characteristic values of words 6 and 7 (that is, $407 + 296 = 703$). Thus:

- $27/91 = 0.296703296703 \dots$, and
- $64/91 = 0.703296703296 \dots$

We also note that $296703 = 9^3 \times 407$, and $703296 = 12^3 \times 407$.

* By arranging the first thirty-six natural numbers in square formation, as shown in Figure A3, we create a structure of considerable interest. Included among its features are the following:

- the total value of the numbers represented is 666 (= 18×37) (see Figure 10 for details of this unique 'triangle of triangles' and first triangular multiple of 37)
- the sum of the numbers forming any row, column, or long diagonal is 111 (= 3×37)
- the sum of the peripheral numbers is 370 (= 10×37)
- the remainder, the 'core' numbers, total 296 (= 8×37)
- each group of four symmetrically-disposed numbers totals 74 (= 2×37)

* Two numbers are said to be 'friendly' or 'amicable' if each is equal to the sum of the proper divisors of the other. The classic example is the pair, 220/284, which was known to the Pythagoreans, thus:

$$220 = 1 + 2 + 4 + 71 + 142 \text{ (the proper divisors of 284)}$$

$$284 = 1 + 2 + 4 + 5 + 10 + 11 + 20 + 22 + 44 + 55 + 110$$

These numerical curiosities are not common, and before the advent of the computer were hard to find. Indeed, it was not until 1636 that a second pair, 17296/18416, was discovered. However, by the end of the 19th century the number of known pairs had been extended to 60. But then a remarkable event occurred: a lad of sixteen discovered the pair 1184/1210! Now these are relatively small numbers, and considering the extensive searches for such pairs from Greek times onwards it is very hard to understand why this instance should have been overlooked.

$$\text{We note that } 1184 = 32 \times 37 = 4 \times 296; \text{ and that } 1210 = 10 \times 11^2$$

* Figure A4 depicts a standard keyboard that reveals the basis of Western music. We observe the following:

- The frequencies of the component sounds that constitute a musical note double at each octave.
- Each octave is subdivided into 12 semitones whose frequencies are in G.P. — common ratio $12\sqrt{2}$.
- The semitones are shown numbered, beginning at some convenient point — bottom C in this case.
- A musical scale consists of a sequence of notes based upon some pattern of semitone intervals, for example, 2, 2, 1, 2, 2, 2, 1 defines all diatonic major scales.

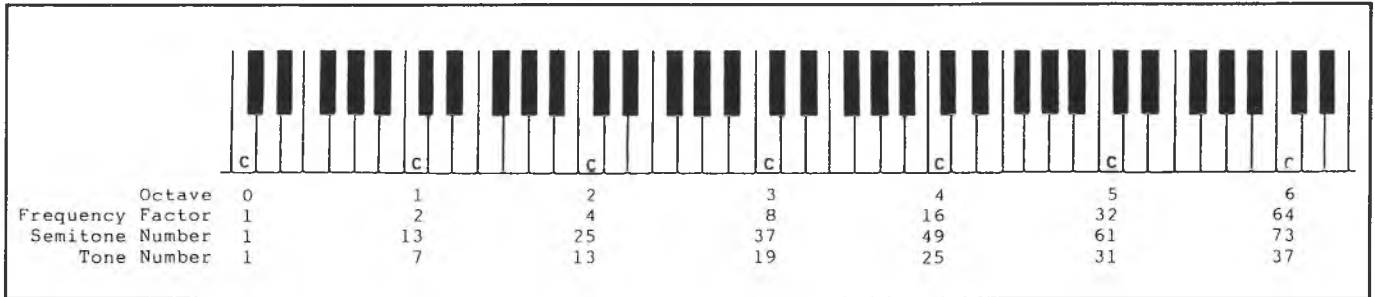


Figure A4. The standard keyboard that is the basis of Western music with octaves, frequency factors, and semitone and tone numbers all depicted.

- Clearly, each octave comprises 6 tones; these also are shown numbered from the same arbitrary point.
- The third octave — tone number 19, semitone number 37 — has a frequency of 8 units; the figurate factors of 703 — second triangular multiple of 37 — are here found associated with 3, and the cube, 8.
- The sixth octave — tone number 37, semitone number 73 — has a frequency of 64 units; the figurate factors of 2701 — third triangular multiple of 37 — are here found associated with 6 — first perfect number, and the cube, 64 (of which 37-as-hexagon is a 2-D representation). (See Figure A7.)
- It has been observed that each semitone interval is defined by the frequency-ratio $12\sqrt{2}$; musically, this is indistinguishable from the rational number 196/185, the error involved being a mere 0.00034%; this fraction may be written, $7 \times 28/5 \times 37$ — involving the seventh triangular and second perfect number, 28, with two of its figurate derivatives, 5 and 37. (See Figure 2.)

We thus find a remarkable concentration of Genesis 1:1-related features in this very basic human attribute of making music.

Significant Developments

Consider the following train of association:

- * We begin with **ten** — principal radix of man’s numbers systems from the beginning, and now confirmed as

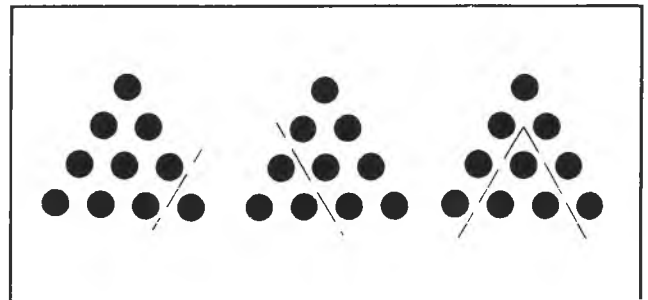


Figure A6. 91 (left) and 37 (centre and right) as implied by a partitioned tetraktys.

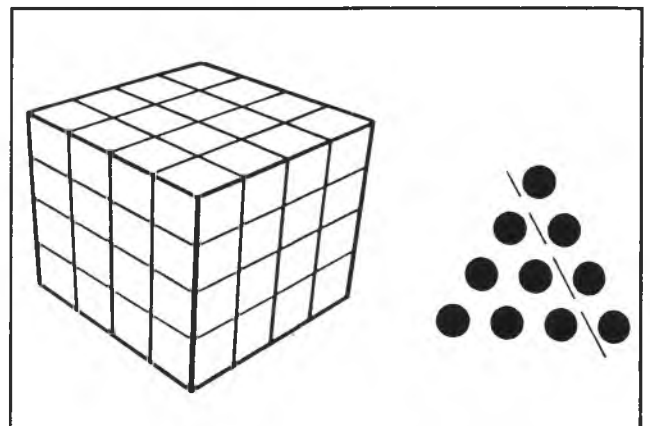


Figure A7. A typical view of 64-as-cube (left) and how the digits of 64 appear in a partitioned tetraktys (right).

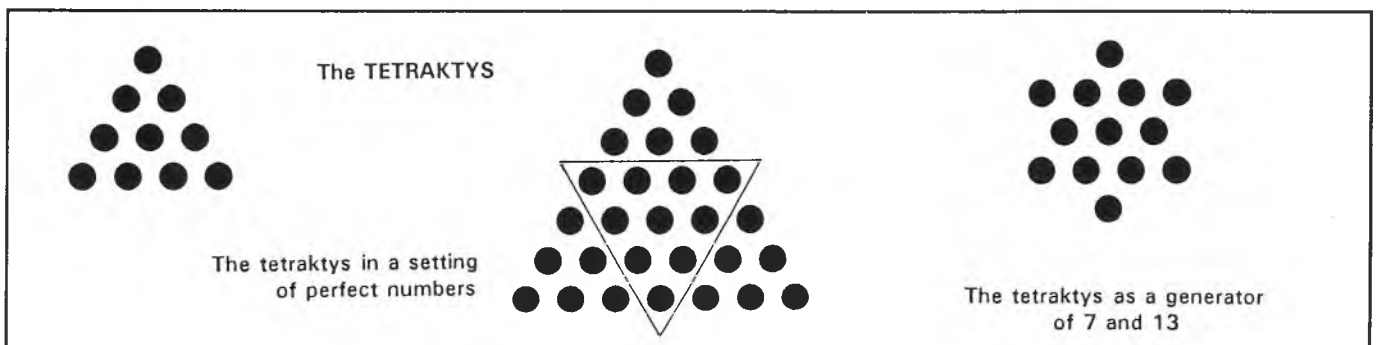


Figure A5. The TETRAKTYS as named by Pythagoras (left), its figurate relationship to 6 and 28 (centre), and how it generates 7 and 13 (right).

such by decimalisation and metrication.

- * 10 is a simple figurate — the sum of the first four numbers, and hence fourth triangular number — named *tetraktys* by the Pythagoreans (c. 600 BC) who, interestingly, regarded it as the source of all things (see Figure A5).
- * We find that it is related figurately (in the manner of Figure 9) to 6 and 28 — both triangular and perfect numbers (see Figure A5).
- * United with an inverted copy of itself, it generates 7 and 13 as hexagon and hexagram, respectively (see Figure A5). These are the factors of the trifigurate number, 91. (See Figure A1 again.)
- * 91, or ‘nine tens plus one’ is suggested by a partitioned *tetraktys* — as is the other trifigurate, 37 (see Figure A6).
- * Further, 37 is also the hexagram of the next pair in the series, and the hexagon of the next following pair.
- * Again, 37-as-hexagon represents a typical view of 64-as-cube; and the digits of 64 also appear in a partitioned *tetraktys* (see Figure A7).
- * As has already been observed, 37 and 91 are related more directly, and independently, by the cubes of 3 and 4, and are the basis of many curiosities and simple recreations; further, the links between 19, 37 and 73 in Western music are particularly strong.

There is no parallel development in the whole of mathematics which embraces so many interesting numerical features, eye-catching symmetries, and recreational possibilities.

The complete structure we have described is thus both absolute — with decimal connotations — and absolutely unique. What a basis for the Genesis 1:1 phenomenon!

FOOTNOTE

1. A Geometrical Progression (G.P.) is a sequence of numbers such that each, after the first, equals the preceding number multiplied by some fixed number, called the **common ratio**; for example, 3, 6, 12, 24, . . . are in G.P. with common ratio = 2.

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