

Kabbalah and String Theory (1995)

Ten Dimensions

According to string theory, all of reality exists in (exactly) ten dimensions. There are four revealed dimensions (the three dimensions of space together with the fourth dimension of time) and an additional six concealed (spatial) dimensions.

In Kabbalah we are taught that God emanated from His infinite light (through the process of *tzimtzum*--the "contraction" of infinity) ten Divine lights or powers (*sefirot*) through which He created the universe. Each of these ten powers can be understood to be a "dimension" of reality. This is the ultimate reason that the Torah chooses the "perfect" number system to be the decimal system (as is said in the Torah: "The tenth shall be holy for God").

All ten dimensions are seen to be contained within the "point-string" (in the idiom of *Chassidut*, "a formed point" [in contrast to "an unformed point"], whose form resembles a tiny "string") of the letter *yud* = 10. The letter *yud* is the first letter of God's essential Name *Havayah* (whose full value equals 26, the sole other possible number of dimensions of the universe according to string theory).

The full spelling of the letter *yud* is: *yud* (10), *vav* (6), *dalet* (4). The two additional letters, the *vav* (6) and the *dalet* (4) themselves equal the original *yud* (10). The full spelling of the *yud* is thus to be understood as an equation: $10 = 6 \text{ plus } 4$. The 10 dimensions of reality divide into two categories, one of 6 and the other of 4.

In Kabbalah, the *vav* (6) is considered the "male" element of reality whereas the *dalet* (4) is considered the "female" element. The "female" principle of reality is "revelation" whereas the "male" principle is concealed within the "female." So is the relation, according to string theory, of the 6 concealed dimensions of reality to the 4 revealed dimensions.

The 6 (which "precede" the four) are in fact: 1 plus 2 plus 3. And so, $10 = 1 \text{ plus } 2 \text{ plus } 3 \text{ plus } 4$. In the terminology of Kabbalah these four stages of the Divine "evolution" of reality are referred to as: "the simple song" (1); "the double song" (2); "the triple song" (3); "the quadruple song" (4).

In the soul of man (who is "a miniature universe"), the first three concealed stages (1 plus 2 plus 3 = 6) correspond to: the power of superconscious will (1, "the simple song"); the two intellectual powers of the mind (wisdom and understanding--2, "the double song"); the three emotive powers of the heart (love, fear and mercy--3, "the triple song"). These stages are "concealed," for they are as yet unexpressed to the "other."

The fourth stage is that of the 4 "revealed" powers of the soul, which express themselves in one's actions (and words) or patterns of behavior (conviction, commitment, devotion, speech--4, "the quadruple song." The first three of these are dimensions of "space": up-down; right-left; front-back respectively. The last is the dimension of "time").

This model of $10 =$ the "triangle" of 4 ($= 1 \text{ plus } 2 \text{ plus } 3 \text{ plus } 4$) is referred to as the "evolutionary" model of reality.

The evolutionary model of reality is subsequently transformed into the "psychic" model of 3 triplets (of "right," "left" and "middle") plus 1: $10 = 3 \text{ squared } 2 \text{ plus } 1 (= 1 \text{ squared})$. This model, in contrast to the previous model, is relatively "mature." Here, the superconscious will--the "1" of the evolutionary model--becomes revealed as conscious "knowledge"--the third, middle element of the first of the 3 triplets--thereby maturing the mental powers of the soul from 2 to 3. The three mental powers then connect to the three emotive powers, which in turn connect to the three "behavioral" ("spatial") powers to equal 3 squared. The

fourth, revealed dimension of time thus becomes the unique consciousness of $1 = 1$ squared.

The psychic model of reality is subsequently transformed into the "Divine" model of $10 = 2$ times 5 (the two prime factors of 10) = (1 squared plus 2 squared) plus (1 squared plus 2 squared). This is the model of the Ten Commandments--five on each of the two tablets of the covenant. Similarly, with regard to the Divine image imprinted on the body of man, ten fingers (or "toes") of the two hands (or two feet), the thumb = 1 squared and the remaining four fingers = 2 squared.

This final model of 10 is considered the model of "Divine Inspiration," for here the four physical dimensions of space and time become "inspired" with consciousness of a "fifth" dimension above them and present within their midst. This is the dimension that corresponds to the third of the three emotive powers of the heart, the power of mercy (or empathy). The consciousness of Divine mercy permeating all of physical reality causes the dimensions of space and time to blend together as an awareness of freely "traveling" in time. In the soul, this reflects the consummate unity of "devotion" (drive) and expression.

Just as the five lower powers (dimensions) of the soul unite to become one, so do the five higher powers. The five lower powers, now the five revealed dimensions of reality, perfectly reflect the five higher, concealed powers. The five higher powers are only concealed in relation to "outer" reality. In relation to the "inner" reality of mind and heart, these as well (in addition to the five lower powers) become revealed.

The mental power of "knowledge" elevates to unite with the source of simple faith--the ultimate "head" of the superconscious, which now becomes revealed to the inner consciousness of the soul. This dimension corresponds to the "concealed" 1 squared. The four powers (dimensions) of wisdom (the "right" power of the mind), understanding (the "left" power of the mind), love (the "right" power of the heart), fear (the "left" power of the heart) corresponds to the "concealed" 2 squared.

The String

Kabbalah teaches that the ten dimensions of reality were initially created *in potentia* by means of the "contraction" of God's infinite light, thereby resulting in the appearance of an "empty space" or "black hole" of "potential" being. Into this primordial "vacuum" enters a "ray" of Divine light, referred to as the "line" or "string." The primordial string "actualizes" the ten manifest dimensions of reality and continues to emanate within them the worlds of creation.

The initial revelation within the primordial vacuum is the revelation of light. In the words of the third verse of Genesis (the first explicit "saying" of creation): "And God said 'Let there be light,' and there was light." This primordial light refers to the Divine ray of light that permeates the vacuum, the Divine "string."

In Hebrew, the numerical value of the word for "string" (*chut*) is 23. 23 is the tenth prime number (beginning from 1). The value of "light" (*or*) is 207. $207 = 9$ times 23. This indicates that every "photon" of the primordial light is in fact composed of a nine-fold string.

In Kabbalah we are taught that one of the primary functions of the primordial string is to "measure." Each "unit" of measure is in fact an individual string. From one initial string become emanated a multitude of strings which fill space. These strings "fold" in and out, "split" into two and our "reunited" into one. These stages most precisely reflect the imagery and terminology of modern string theory.

The "folding" process relates to the initial "world" which enclothes the ray of Divine light, known in Kabbalah as "Primordial Man." The "splitting" process relates to the subsequent "world of chaos," which split apart and broke. The "reuniting" process relates to the subsequent "world of rectification."

In the "world of rectification," the tiny "reunited" string segments give rise to full-fledged "particles" or "sparks." Each particle is in fact a "full" or "rectified" "stature," which is able to reflect the presence of its Creator.

The numerical value of the word for "particle" or "spark" (*nitzotz*) is 236. This is the number that our Sages (in the *Midrash*) identify as the "measure" of Divine "stature."

The consummate "union" of the two concepts of "string" and "particle" is represented in Kabbalah as the product of their two numerical values: 23 times 236 = 5428. The number 5428 is the sum of the five "whole number interactions" between the two numbers 6 and 4:

$$6 \text{ minus } 4 = 2$$

$$6 \text{ plus } 4 = 10$$

$$6 \text{ times } 4 = 24$$

$$6 \text{ to the } 4\text{th} = 1296$$

$$4 \text{ to the } 6\text{th} = 4096$$

$$2 \text{ plus } 10 \text{ plus } 24 \text{ plus } 1296 \text{ plus } 4096 = 5428$$

(The fact that every pair of numbers gives rise to five "whole number interactions" reflects the "Divinely inspired" representation of the number 10. $10 = 2 \text{ times } 5$).

In the Torah, the *mitzvah* ("commandment," from the Hebrew root which means "to connect") which explicitly relates to "strings" is the *mitzvah* of *tzitzit*. The *mitzvah* of *tzitzit* requires that a four-cornered garment possess four strings bound to each of its corners. The four strings are folded over to produce the effect of eight strings hanging from each corner. These eight strings are bound together by 5 double knots: $2 \text{ times } 5 = 10$.

The purpose of the *mitzvah* of *tzitzit*, explicitly stated in the Torah, is to remind us of all the 613 *mitzvot* of the Torah. The *mitzvah* of *tzitzit*, is therefore considered to "weigh against" ("balance") all of the 613.

In "small number calculation" (reduction of each letter to equal 1-9), the word *tzitzit* (as written in the Torah) = 23 (the value of "string").

According to the Torah, there are two colors to the strings of the *tzitzit*, white and blue. In "small number calculation," the word for "white" (*lavan*) = 10. The word for "blue" (*techailet*) = 13. $10 \text{ plus } 13 = 23$ (the value of *tzitzit* and the value of "string"). As 23 is the tenth prime number (as mentioned above), this alludes to the fact (explained in Kabbalah and reflected in nature) that the "blue" of the *tzitzit* is rooted and contained within the "white."

The full value of "white" (*lavan* = 82) and "blue" (*techailet* = 850) is 932. This is the value of "the Tree of Knowledge of good and evil" (*etz hada'at tov v'rah*), as to be mentioned.

The two colors of the *tzitzit* represent the ability of the string to split into two and reunite as one. The word for "one" in Hebrew, *echad*, is composed of three letters whose numerical values are 1, 8, 4 (which together = 13). The "evolving" form of "one": $(1) \text{ plus } (1 \text{ plus } 8) \text{ plus } (1 \text{ plus } 8 \text{ plus } 4) = 23$. This phenomenon indicates the power which inheres in the string (= 23) to unite reality.

Would we meditate deeper upon the multitude of laws and exact manner of binding the strings of the *tzitzit*, we would most certainly discover and clarify many of the deepest secrets of the universe.

Four Forces from One

The ratio 1:4 ("one to four" or "one becoming four") is one of the pillars of creation as revealed in the beginning of the Torah. We will here observe four phenomena from Genesis based upon the ratio 1:4.

The two letters *alef* (= 1) and *dalet* (= 4) form together the word for "vapor." In the beginning of creation, the "vapor" rose from the earth to moisten the earth for the sake of the creation of man.

One river flows from Eden to the garden, which thereafter, leaving the garden, divides into the four great rivers of the earth.

"The Tree of Life" (*etz ha'chaim*) = 233. "The Tree of Knowledge of good and evil" (*etz hada'at tov v'rah*) = 932. $932 = 4 \text{ times } 233$. Thus the ratio of the two trees is "one to four" (the "one" being the Tree of Life and the resulting "four" being the Tree of Knowledge of good and evil).

The word "good" (*tov*, the positive force of the Tree of Knowledge of good and evil) = 17. The word "life" (*chaim*, of the Tree of Life) = 68. $17:68 = 1:4$. The word for "life" possesses four letters. The average value of each of its letters is "good." Thus we see that the fundamental force of "life" (of the Tree of Life) is in fact the positive force of "good" (inherent in the Tree of Knowledge of good and evil). The two trees thus create an infinite cycle of Divine energy.

To conclude, the most obvious phenomenon in the Torah related to the four forces of nature deriving from one, is that God's essential Name *Havayah* is composed of four letters. "God is One." In the future it will become revealed that "God is One and His Name is One." "His Name" refers to the four letters of *Havayah*. This is the ultimate revelation of the Divine "unified field theory."



GALEINAI PUBLICATION SOCIETY

2 Hausner St. • Jerusalem 96431 • tel.: 972.547.533770 • info@gpsociety.org