

Torah and Science

# The Hebrew Language: An Ideal Model for Information Processing and Management

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## Clearly Hebrew

One of the main focuses in modern computer science is information processing and management. Gathering and retrieving relevant information is probably the most significant point of outset in almost any project that the modern professional or layman may undertake and it becomes imperative that the retrieval process quickly and efficiently find accurate sources that precisely serve his purposes. To this end there are many information management theories currently available.

The prophets have already promised that in the future there will come an era of peace on earth in which all nations will speak one language. In Hebrew the term the prophet uses is *safa berurah*, a **clear** language. Language is something far broader than mere words. As we can see from the term "body language," the actions we perform and the way we move our hands is all a form of communication. In the future all the nations of the earth will speak, think and act out one clear, rectified language. Clearly, this language is the Hebrew language, which we are taught in the Torah and in Kabbalah is the language that God used to create the world. Unlike other languages, Hebrew, the ancient and holy language of the Bible, is the only completely logically structured language and it therefore presents us with an ideal model for organizing information and meaning.

## Lights in Vessels

There are 22 letters to the Hebrew language. Although this is not the place to discuss all of the reasons why the number 22 is significant in itself, we will demonstrate here one connection between the number twenty-two in relationship to the universally accepted<sup>2</sup> decimal system of counting.

One of the most basic relationships between the ten *sefirot* and the twenty-two letters can be observed very simply in the relationship between the area and the



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perimeter of a 1x10 rectangle, which are 10 and 22 respectively. We will later explore the general algorithm of this phenomenon  $[2(n + 1)]$  in further detail. As a body is to a soul, so the twenty-two letters of the Hebrew alphabet are the relatively material vessels (the perimeter; the confining limit) that contain the spiritual lights of the ten *sefirot* (the area; the content of the rectangle).

### Gates and Roots

None of the twenty-two letters of the Hebrew language bears any specific linguistic meaning when standing on its own<sup>3</sup>. In order to generate meaningful units of language in Hebrew there must be a minimum of two letters together. One of the beauties of the Hebrew language is that all of the roots of all verbs and nouns are derived from two-letter units that are usually assembled as part of a three letter root.

In Kabbalah, the two letter units are called *sha'arim*, gates, since if one would perceive each of the letters of the unit as a pillar on each side of a gateway, one can pass through the gateway from either direction, thus obtaining two different permutations of the two-letter units from one gate. These two-letter units are sub-roots, each sub-root being a gateway to meaning and understanding. We are taught in Kabbalah that there are 231 gates. This can be calculated mathematically: since there are 22 letters we take one of the 22 and match it with one of the 21 remaining letters,<sup>4</sup> which results in 462 ( $22 \cdot 21$ ) possible matches. This gives us all the possible permutations of two-letter units including both permutations of the same *sha'ar*, gate. In order to arrive at the exact number of *sha'arim*, we must divide the result by the number of permutations available for the same two letters (2!) by which we arrive at the number 231.

$$\frac{22 \times 21}{2!} = \frac{462}{2} = 231$$

Developing from the two-letter sub-roots, we arrive at the three-letter roots called *shorashim* in Hebrew. Just as each *sha'ar* (two-letter-root) has 2 (2!) permutations, so each *shoresh* (three-letter-root) has 6 (3!) permutations. We can thus calculate that the total number of possible *shorashim* (three-letter-roots) in the Hebrew language is 1540<sup>5</sup>:

$$\frac{22 \times 21 \times 20}{3!} = \frac{9,240}{6} = 1,540$$

## All in a Name

Another quality unique to the Hebrew language is that each of the twenty-two letters bears a numerical value, by which the numerical value of any given word can be calculated. One of the seven disciplines of Torah study mentioned in the *Zohar*, is *gematria*, the study of the numerical value of words. The sages often base their interpretations of meaning on the numerical value of words, letters, or even complete phrases.

For illustrational purposes, interpreting the name "Israel," ישראל (the name of the Jewish people; our land of Israel; the Torah which is called the Torah of Israel; and even God Himself who is called the God of Israel), by means of its numerical value, especially highlights the beauty unique to our language, as we shall explain.

Kabbalah teaches us that one of the readings of the word *Yisrael* is *yesh-rala* (יש רלא), which simply means "there are (רלא) 231 [gates]." However, a second way of interpreting the word *Yisrael* is by using the numerical value of 1,000 for the *alef*<sup>6</sup>, thereby arriving at the numerical value of 1540 for the word "Israel"—exactly the total number of *shorashim* (three-letter-roots) that can be derived from the 22 letters of the Hebrew alphabet. We can therefore see how the Hebrew language is an essential part of everything Jewish, including the revelation of God Himself.

## Triangles and Tetrahedrons

Besides their significance in the Hebrew language, mathematically speaking these two numbers (231 and 1,540) are also very significant numbers. The most basic geometric form is a triangle, even more basic than a square, since a square can be divided into two triangles. The fact that the triangle is the basic shape is apparent throughout nature, especially in crystallography and other natural sciences. The formula for a triangular number<sup>7</sup> is  $\Delta n = n(n + 1)/2$ . When  $n = 21$  this formula renders an equation that is identical to the one we used to calculate the number of gates in the Hebrew language, and it generates a sum of 231. The number of gates produced from the 22 letters is therefore equal to the sum of all numbers from 1 to 21.

Although the number 231 can be expected to be a triangular number, considering the way that it was generated in this case, it is more surprising that 1,540 is also a triangular number—a triangular number being a relatively rare phenomenon. 1540 is the triangle of 55 (written:  $\Delta 55$ ).<sup>8</sup> However, amazingly, this number is also the tetrahedron of 20 (written:  $\Delta_2 20$ ), i.e., the sum of all triangular numbers from  $\Delta 1$  to  $\Delta 20$ . Physically, this is a three dimensional construction created by arranging each triangle one above the other from the smallest to the

largest. It is an extremely rare phenomenon to find a tetrahedron that is also a triangular number, but 1,540 is one of these unique numbers, as displayed in the following series:<sup>9</sup>

1, 10, 120, 1540, ...

There are three simple Hebrew words that denote this phenomenon of simultaneously being a 2 dimensional triangle and a 3 dimensional tetrahedron. For the number 10 the word is **גד**, pronounced: *gad*, the name of one of the twelve tribes. *Gad* is composed of the two letters *gimel* and *dalet*, with respective numerical values of 3 and 4. Regarding the number 10, this represents the fact that 10 is equal to  $\Delta_4$  and  $\Delta_2 3$ .

Similarly, the word which alludes to the number 120 is **חיה**, pronounced: *chayah*, which has a variety of meanings. *Chayah* is the name that the first woman, Eve, would have been given had she not sinned and also the name by which she will be called in the future when the primordial sin is rectified. *Chayah* also means, "a living being." It is also the name of one of the types of angels seen in the vision of the chariot of Ezekiel. However, the most important meaning of *chayah* in Kabbalah is the second highest of the five levels of the soul. *Chayah* is spelled with the letters *chet*, *yud* and *hei*, with respective numerical values of 8, 10 and 5, alluding to the number 120 which is both  $\Delta_2 8$  and  $\Delta(10 \pm 5)$ .

The word relating to the number of roots in the Hebrew language is the word **כהן**, pronounced *kohen*, which means "priest." It is spelled with the letters *kaf*, *hei*, *nun*, whose respective numerical values are 20, 5, and 50 alluding to the fact that  $1540 = \Delta 55 = \Delta_2 20$ . However, as we mentioned previously, 1540 is one of the possible numerical values of the word "Israel," the non-priest, so we can see here a mathematical allusion to the close relationship between the two.

Within the context of the *sha'arim* and the three-lettered *shorashim*, we will note here another beautiful mathematical phenomenon that illustrates the harmony between the two. Since 1540 is  $\Delta_2 20$ , if one adds the next triangular number ( $\Delta 21$ ) to the tetrahedron one has raised the tetrahedron by one level, producing  $\Delta_2 21$ . Remember though, that  $\Delta 21 = 231$ , the number of *sha'arim* in the Hebrew language, as mentioned!

### A Simple, Double, Triple, and Quadruple Song

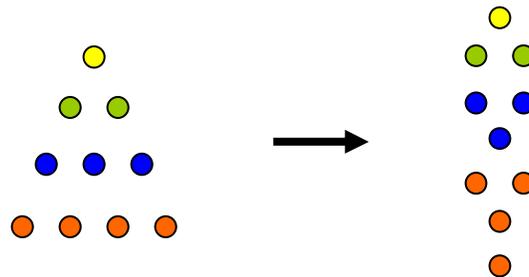
As mentioned previously, there is a mathematical relationship between 10 and 22. The most important algorithm which appears in Kabbalah and the Torah is  $2(n \pm 1)$ . Applying this algorithm for  $n = 1$  generates  $2(1 \pm 1) = 4$ . If we then continue to apply this algorithm to the result:  $n = 4$ ,  $2(4 \pm 1) = 10$ ;  $n = 10$ ,  $2(10 \pm 1) = 22$ . We have thus generated the following series of numbers:

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1, 4, 10, 22...

These first four numbers share the basic system of development of  $n_2 = 2(n_1 + 1)$ . As we mentioned before, the relationship between 10 and 22 is the ten *sefirot* or lights and the 22 letters of the Hebrew language, the vessels that contain the lights, which are the ten soul elements and the 22 relatively body elements of creation. However, if we consider the numbers that precede these two – 1 and 4 – we will realize that the number 4 is the triangular "root" of 10. This alludes to the "simple, double, triple, and quadruple song," which corresponds to the internal division of the 10 *sefirot* into four groups, as shown:



In the soul, or in the *sefirot*, the simple song refers to the **super-conscious** crown. The double song refers to the two basic **intellectual** faculties, wisdom and understanding, referred to as the father and mother figures respectively. The triple song refers to the three **emotive** powers of the soul which are loving-kindness, awe, and compassion. The quadruple song refers to the four emotions which manifest themselves in **action**.

Thus the number 4 is an even more basic model of creation than the number 10. Indeed, God's ineffable Name, is composed of four letters. The Tetragrammaton, God's unique and essential Name, which literally means "the four-lettered Name," precedes the ten lights. Even in English this is not an arbitrary name because it is derived from the Talmudic idiom for God's essential Name used by the sages themselves: "the four-lettered Name." This means that there is something essential about the fact that it has four letters.

Although the number 4 indeed precedes the number 10, God is One and 1 precedes everything. One is the beginning or God's absolute and essential Unity. So the very fact that this algorithm generates 4 from 1 and 10 from 4 and 22 from 10, producing three<sup>10</sup> very significant numbers, shows that it is a very essential and important algorithm, and it provides us with the relationship between 10 and 22.

### More About $2(n + 1)$

Although there are generally only ten *sefirot* counted, an eleventh *sefirah* is often included—the *sefirah* of knowledge, which is the reflection in the consciousness

of the super-conscious crown and is often included with wisdom understanding, as a third intellectual faculty. The source of knowledge comes from a point that transcends the division of the two levels of reality, the intellect and the emotions, bridging between the two extremes and connecting them.

The algorithm  $2(n + 1)$  can also be written:  $2n + 2$ , however, writing it as  $2(n + 1)$  is more relevant to our purposes, since  $n + 1$  implies that one of the *sefirot* appears at two different levels; at the level of super-consciousness, the simple song, and in consciousness itself, which in the soul is knowledge or unification. Knowledge is not an intellectual power or faculty in its own right, it is the power to concentrate one's mind in order to arouse emotion in one's heart: a bridge between intellect and emotion.

We have now eleven *sefirot*, however each of the eleven possesses an inner and an outer dimension to it, which brings us directly to the completion of our algorithm:  $2(n + 1)$ . We have thus developed from  $n$  to  $n + 1$  and then to  $2(n + 1)$  since each of the  $n + 1$  *sefirot* has two dimensions to it. In our case, when  $n = 10$ ,  $n + 1 = 11$  and  $2(n + 1) = 22$ .

### An Ancient Logical Array

The original source for the concept of the 231 gates of the Hebrew language is *Sefer Yetzirah*, the Book of Formation. Since the gates initiate meaningful units of language, for the purposes of computer science logic it would be convenient if these 231 gates were organized in a logical system. This is exactly what *Sefer Yetzirah*, an ancient text, attributed to our patriarch Abraham, actually does, arranging the 231 gates in a square array in which each column and each line corresponds to one of the eleven<sup>11</sup> *sefirot*. In our particular depiction of this array, the vertical axis incorporates both facets to it: the A row represents the inner dimension and the B row the outer dimension, as mentioned, generating a complete array of  $22 \times 11$  (242 possible pairs). However eleven of these pairs appear twice in the array (these duplicates appear in a bold typeface), as we shall explain, reducing the number of differing pairs to 231. These duplicate pairs are also unique in that they make up the most basic alphabet transformation called *albam* (אלבם).

11	10	9	8	7	6	5	4	3	2	1		
בת	גש	דר	הק	וצ	זפ	חע	טס	ינ	כמ	אל	A	1
גת	דש	הר	וק	זצ	חפ	טע	יס	כנ	למ	אב	B	
דת	הש	ור	זק	חצ	טפ	יע	כס	לנ	במ	אג	A	2
הת	וש	זר	חק	טצ	יפ	כע	לס	מנ	בג	אד	B	
ות	זש	חר	טק	יצ	כפ	לע	מס	גנ	בד	אה	A	3
זת	חש	טר	יק	כצ	לפ	מע	נס	גד	בה	או	B	
חת	טש	יר	בק	לצ	מפ	נע	דס	גה	בו	אז	A	4
טת	יש	כר	לק	מצ	נפ	סע	דה	גו	בז	אח	B	
ית	כש	לר	מק	נצ	ספ	הע	דו	גז	בח	אט	A	5
כת	לש	מר	נק	סצ	עפ	הו	דז	גח	בט	אי	B	
לת	מש	נר	סק	עצ	ופ	הז	דח	גט	בי	אכ	A	6
מת	נש	סר	עק	פצ	וז	הח	דט	גי	בכ	אל	B	
נת	סש	ער	פק	זצ	וח	הט	די	גכ	בל	אמ	A	7
סת	עש	פר	צק	זח	וט	הי	דכ	גל	במ	אנ	B	
עת	פש	צר	חק	זט	וי	הב	דל	גמ	בנ	אס	A	8
פת	צש	קר	חט	זי	וכ	הל	דמ	גנ	בס	אע	B	
צת	קש	טר	חי	זכ	ול	המ	דנ	גס	בע	אפ	A	9
קת	רש	טי	חכ	זל	ומ	הנ	דס	גע	בפ	אצ	B	
רת	יש	טכ	חל	זמ	ונ	הס	דע	גפ	בצ	אק	A	10
שת	יכ	טל	חמ	זנ	וס	הע	דפ	גצ	בק	אר	B	
כת	יל	טמ	חנ	זס	וע	הפ	דצ	גק	בר	אש	A	11
כל	ימ	טנ	חס	זע	ופ	הצ	דק	גר	בש	את	B	

## Legend:

1	2	3	4	5	6	7	8	9	10	11
כתר	חכמה	בינה	דעת	חסד	גבורה	תפארת	נצח	הוד	יסוד	מלכות
Crown	Wisdom	Understanding	Knowledge	Loving-kindness	Might	Beauty	Victory	Thanksgiving	Foundation	Kingdom
Faith / Pleasure/ Will	Selflessness	Joy	Union	Love	Fear	Mercy	Confidence	Sincerity	Truth	Lowliness

In order to generate each row in the table, the pairs of letters are constructed using the following process, grouping them into 22 different "alphabets," each with 11 pairs<sup>12</sup>:

The 22 letters are written in order and divided into two segments, each time with the split between two different letters. For the first line (1A) they are divided after the first letter (*alef*), one letter on the right and 21 letters on the left. For the second line (1B) after the second letter (*bet*), two letters on the right and 20 on the left, and so on. Then the letters in each segment are paired, the first with the last, second with second to last, and so on. This is called reflective pairing. If the segments have an odd number of letters, the remaining letters in (the middle) of each segment are paired with one another.

We will use the first line (1A) to demonstrate this process:

א|בגדהוזחטיכלמנסעפצקרשת

Since א is alone in its segment and has no pair, it "waits." Now the letters in the left segment are paired reflectively, generating the pairs: כמ, ינ, טס, חע, זפ, וצ, הק, דר, גש, בת. The ל is left over in the right segment, so it is paired with the א. Thus we have 10 pairings and a duplicate pair (אל, which also appears regularly in the location 6B1).

This system of pairing is called reflective pairing. This is just one of many transformation systems of the Hebrew letters that are used, not only in Kabbalistic texts, but in the Talmud as well. Even in the Bible we find examples of word transformation that use these systems. The most important transformation found explicitly in Biblical usage is known as *atbash* (אתב"ש)—for its first two letter pairs—on occasions when Jeremiah calls Babylon (בבל) *Sheishach* (ששך).<sup>13</sup> The *atbash* transformation is the basic reflective transformation by which the first letter is transformed into the last letter, the second letter into the second last letter and so forth.

Since it contains an even number of letters, the Hebrew alphabet can be split into two equal halves; pairs can then be generated either reflectively or by parallel pairing. Let us illustrate each:

כ	י	ט	ח	ז	ו	ה	ד	ג	ב	א
ל	מ	נ	ס	ע	פ	צ	ק	ר	ש	ת

  
 Reflective pairing in the *atbash* transformation

כ	י	ט	ח	ז	ו	ה	ד	ג	ב	א
ת	ש	ר	ק	צ	פ	ע	ס	נ	מ	ל

  
 Parallel pairing in the *albam* transformation

In Kabbalah, the *albam* transformation is called the straight transformation because it pairs the letters of each half in a parallel fashion, whereas the *atbash* transformation pairs the letters of each half reflectively. In the later Kabbalistic texts, for instance the Arizal, the most important *alef-bet* transformation is *albam*, and this is the *alef-bet* that appears twice in the array of 22 alphabets shown above, woven into the array like a golden thread. The bottom line in this array is the *atbash alef-bet* which is the most basic reflective *alef-bet*.

Having constructed this array, we can deduce the kernel meaning of each two-letter unit by analyzing its position in the array. In theory, one could create a perfect lexicon of etymology of the Hebrew language by analyzing the position in the array of each two-letter unit. One could then go on to apply this to other languages, since according to Rabbi Avraham Abulafia, one of the great medieval Kabbalists, the seventy languages of the nations on earth all derive in

some way from the Hebrew language. This would give us insight into the kernel ideas of all words in every language.

### Beginning with a Clear Example

In order to illustrate this idea, we will now analyze in short the first word of the Torah, *bereisheet*, which means "In the beginning."

ב ר א ש י ת

The word *bereisheet* has three root letters (ראש) and three additional letters: a one-letter prefix (ב) and a two-letter suffix (ית). The three root letters spell the word *rosh*, meaning "head" or "beginning." However, in Kabbalah every letter and every combination of letters is analyzed and understood in its own right. The first two letter unit that begins the whole Torah and the whole creative process is therefore בר. The second two letters are אש, which means fire and the two suffix letters (ית) are also considered as a third unit on their own.

The *sha'ar* (two-letter root) בר appears in our array at 11A2. Note that the first letter-pairing in that transformation is surprisingly אש, the second two-letter unit of *bereisheet*. We thus immediately see that this particular *alef-bet* has great significance regarding the beginning of creation. The split in the *alef-bet* here is between the *shin* and the *tav*. The only *alef-bet* to follow this is the one where the split is invisible, i.e. placing the line of the split after the final letter of the *alef-bet*, the *tav*, which generates the *atbash* alphabet (11B), mentioned previously.

Our aim is to arrive at the kernel meaning of the *sha'arim*, the first of which that appears in the Torah is בר. If we examine the position of this *sha'ar*, we see that it is the inner wisdom within kingdom (see legend), this can be stated otherwise as the experience of selflessness, the inner dimension of wisdom, within lowliness, the inner dimension of kingdom. In terms of archetypal soul-roots<sup>14</sup> this is Moses, who stated in complete annulment of self, "and we are naught," in King David, who said of himself, "I am lowly in my eyes." Although these two attributes may seem similar, selflessness is annulment of self-consciousness, having no sense of ego, whereas lowliness is a feeling of humility and a complete lack of arrogance, of existing far from God (due to my own imperfections), always aspiring to draw nearer to Him. And so, I feel that it is only by God's mercy and compassion that I succeed to achieve my life's goals. Each of the attributes of the *sefirot* possesses the property of inter-inclusion, which is a hologram-type phenomenon in which each *sefirah* is present in all the others.

Thus God began the creation with בר, with wisdom within kingdom. This is upheld by the Aramaic translation of the word *bereishit*, which is "With **wisdom** God created..." Another illustration of this point is the fact that the only other

context in which the word *bereishit* appears in the Bible is in reference to the beginning of the kingdom of one of the kings. The word *reishit* also appears in Psalms together with the word wisdom in the verse, "the beginning of wisdom is fear of God." We can thus see that these two first letters are wisdom together with kingdom, and the creation was achieved through God's wisdom, as the verse states, "You have made all with wisdom," which the *Zohar* translates as, "All is **clarified** through wisdom." The Aramaic (and Hebrew) word for "clarified" (אתבריירו) is itself a conjugate of the *sha'ar* בר, therefore bringing us closer to the kernel meaning of this *sha'ar*, which is clarification.

The function of wisdom is to clarify reality, however in its original manifestation in the essence of the mind it is not capable of becoming involved in clarifying reality—only when wisdom is expressed through the prism of kingdom can it become an active clarifying force in creation. In fact one could say that if one had perfect clarity one would be able to create things ex-nihilo. The fact that we cannot create is because reality is dim and dull; light and darkness are mixed up together in all of life's phenomena, preventing us from differentiating and distinguishing between the various phenomena in the world. As such, we are not able to truly manifest and fulfill the potential that we have. God created us in His image in order to emulate Him and to create. Every soul is a part of God and has the potential to carry out its true function, to have a creative effect upon reality. In particular this is the special function of the Jewish People – to emulate God and to create light. The ability to create is simply a function of true clarity and this is the kernel meaning of the two first letters of the Torah, בר.

Having arrived at the kernel meaning of a two-letter root, we must now examine all of the roots and the meanings that derive from this two-letter sub-root. One can then give them a Kabbalistic model of relationship of one to the other. The Kabbalistic model is based upon the basic frame of reference or template—the *sefirot*.

The first three-letter root constructed from the two-letter sub-root בר, is the second word of the Torah, the word that follows בראשית, which is ברא, meaning "created." In fact, the first half of the first word is identical to the second word of the Torah. The second three letters of the first word read שית, which in Aramaic means "six." בראשית can thus be understood to mean ברא שית, "He created six," alluding to the fact that God created the world in six days. Rabbi Avraham Abulafia interprets the "six" as referring to the six possible permutations of every three-letter Hebrew root.

[Before continuing to discuss the various three-letter roots that stem from בר, we will note another phenomenon connected to our algorithm of  $2(n + 1)$ , which

generates the number 4 from 1; 10 from 4, and 22 from 10, as mentioned previously. Another meaning of the 4, other than the four letters of God's ineffable Name, relates directly to the 22 letters since four of the 22 can function as consonants or vowels. The Ibn Ezra, one of the literal commentators on the Torah, explains that there are actually 26 letters to the Hebrew alphabet, 26 being the numerical value of God's Four-lettered Name, explaining that 22 are consonants but if we add the 4 letters that function also as vowels the total is 26. Yet 4 and 22 are two numbers in the series: 1, 4, 10, 22, while 22 is the total numerical value of those 4 additional letters<sup>15</sup>. In this case we have skipped over the 10 and related 4 directly to 22.]

### Ten Clear Words

When one of the vowel letters is added to a two-letter root, the root remains unchanged (any other letter added produces a new three-letter root) and the following figure illustrates ten words generated from the two-letter root **בר** and one or more of the four vowel letters. These ten words are positioned in the figure according to the ten *sefirot*.

	<b>בר</b>	
	<b>crown</b>	
<b>ברה</b>		<b>בהר</b>
<b>understanding</b>		<b>wisdom</b>
<b>ברא</b>		<b>אבר</b>
<b>might</b>		<b>loving-kindness</b>
	<b>בריא</b>	
	<b>beauty</b>	
<b>בור</b>		<b>בירה</b>
<b>thanksgiving</b>		<b>victory</b>
	<b>ברית</b>	
	<b>foundation</b>	
	<b>באר</b>	
	<b>kingdom</b>	

We will now continue to explain each word very concisely. The two letter sub-root itself is situated in the place of *keter*, crown. The next word that is positioned in the place of wisdom is the word **בהר**, pronounced "*bohar*," which is one of the thirteen synonyms in the Torah for light. Light is one of the most basic Torah concepts, which is why it can be described in so many different terms. The specific term of *bohar* relates to **clear**, brilliant light.

ברה, pronounced "*barah*," is in the position of understanding and it means clarification or differentiation. This root is also used in the context of **clearing** an area, such as cutting down a forest or clearing an area of rubble etc.

אבר, pronounced "*eivar*," is in the position of loving-kindness and it means a limb of the body, or the wing of a bird. In Kabbalah and Chasidut it refers, in particular, to the power of love by which our souls fly up to heaven. The limbs of the body are clarified in the mother's womb until they are fully developed from the *ubar*<sup>16</sup>, the embryo, into the perfected limbs of the newborn infant.

ברא, pronounced "*bara*," the most important word in our case, is in the position of might and it means to create, as we explained that creation is a function of **clarity**. To create ex-nihilo requires to complete concealment of the Creator from the created. This involves the ultimate manifestation of Divine might.

בריא, *bari*, is in the position of beauty and it means healthy. One of the Chassidic readings of *bereishit bara*, is actually *bereishit bari*, meaning that "in the beginning" one should be healthy. Being healthy implies that the body is **clear** of all extraneous matters and that all systems are functioning in harmony.

בירה, *birah*, is in the position of victory and it means a capital city. The capital city of a country must be more distinguished than other cities, faithful to the national themes and **clear** of foreign influences. It symbolizes the eternity of the nation and its power to be victorious over its enemies (*netzach* means both victory and eternity).

בור, *bor*, is in the position of acknowledgment and it means a pit, a vacuum, an area that is defined by the (apparent) absence of matter. The beginning of the creative process involves creating a vacuum, an area **clear** of God's light, as it were. In Kabbalah we are taught that understanding extends (to become fully revealed) to acknowledgment. Above we saw that the origin of the clearing process is in understanding; its final manifestation is revealed here in acknowledgment, the creating of an apparent vacuum. This is called the *tzimtzum*, the initial contraction of God's light (a continuation and culmination of the power of might, the *sefirah* that lies on the left axis of the Tree of Life between understanding and acknowledgment). Our Divine service within the vacuum is always to acknowledge God's presence; His light has appeared to disappear, but in truth is here exactly as it was before the *tzimtzum*.

ברית, *brit*, is in the position of foundation and it means covenant. This most important meaning of בר relates to the covenant that the Creator makes between Himself and His creations whom He created in His image – mankind. The *brit* is the point of connection and in order to affect a rectified relationship it must be clear of all extraneous intent.

בַּאֵר, *be'er*, is in the position of kingdom and it means a wellspring. Our forefather Isaac was occupied with digging wells which is also a clarification process – a sub-terrestrial clarification process. The living, **clear**, pure waters that come from a wellspring have a much more intense power of purification (in *halachah*, the laws of the Torah) than rainwater that comes from the sky above. In Kabbalah, kingdom represents feminine energy, the power to arouse from below, the "feminine" waters of the wellspring.

### Clarity Creates

From this very concise explanation of these words we can see that there is a very strong common denominator that connects them all, the concept of clarity or clarification. The idea that clarity creates can be illustrated by a common example, for instance a scientist who has great clarity of mind and makes new discoveries. A true moment of clarity will immediately produce a new eureka experience of discovery, a new invention, or a new idea. A eureka experience, a very important concept in Kabbalah, is the sudden revelation of a new idea that has never before been revealed as it enters one's mind; it is in a sense a new creation in the mind. From the mind it continues to become a new creation in the world. Until that moment of clarity, the matter had been confused and some sort of mental or psychological block had existed, but once the confusion vanishes something new is created.

Although the initial creation of the world (and its continual recreation) is *ex-nihilo*, nonetheless the sages teach that God first created worlds which did not find favor in His eyes and which He therefore destroyed. Finally He created this world and saw it to be good (as recorded in the beginning of the Torah). What God disliked about the previous worlds was the confusion, the lack of clarity and differentiation between good and evil, light and darkness etc. In this world, the first thing that God saw to be good was the brilliant light of the first day of creation, which He immediately separated/differentiated from the primordial darkness.

The second pair of letters in the Torah is **שָׂא**, which is the *sha'ar* situated in the crown of kingdom in this array. Although one might think that the crown of kingdom should precede the wisdom of kingdom, as it does in the array, in the Torah the order is reversed. The crown of kingdom symbolizes the willpower to rule. As explained previously, God disliked the first worlds that He created and He therefore destroyed them. Although we cannot understand God's motives, nonetheless, in Kabbalah there are different rationales offered for the logic of creation, one of which is that a king cannot be a king without a people. God assessed all of the initial worlds that He created and they were all too egocentric

to accept His rule, until He created this world which had the greatest potential to accept His kingdom.

This Godly "trial and error" process is similar to the process that God prepared for Adam, the first man, in finding His soul-mate. When Adam was first created he was single and did not have a mate. God brought him all of the animals and Adam tried them all but did not find himself a suitable soul-mate until God created Eve from Adam's own rib and then he truly felt that this was indeed his true soul-mate. Splitting Eve from Adam and then bringing them together once more was a clarification process. In the same way God created the worlds and he did not desire to be king of any of them (for they were not fitting subjects) so He destroyed them all and created a world that is good, over which He desired to rule. The willpower to rule is the *זש* that means fire, however first must come the wisdom of clarity and then becomes manifest the will to rule over this particular domain.

We have thus seen an example of how a two-letter unit of the Hebrew language, the Holy Tongue, has a specific kernel meaning that is related to its position in the array. By analyzing each of the 231 *sha'arim* in this way it would be possible to achieve a systematic understanding of the language that would facilitate many and various actions in computer sciences. In this way, Hebrew may well be a perfect language for information processing and management in today's computerized world.

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<sup>1</sup>. Edited by Rachel Gordon. Based on a class given on *Cheshvan 19, 5766* | November 20, 2005 | at UC at Berkeley

<sup>2</sup> Although in the secular educational system the decimal system is considered to be an arbitrary system, Judaism holds that this is not so. One of the most basic precepts of Kabbalah is that there are ten *sefirot*. These are the ten channels of Divine, creative energy through which the Creator continuously re-creates the universe. Each of these ten channels is holistic in character, including within it each of the characteristics of the other nine, and as such, every facet of creation manifests and reflects this decimality, making base ten the natural and simplest choice to use.

<sup>3</sup> Although each of the letters does represent a complete array of ideas as explained in length in *The Hebrew Letters: Channels of Creative Consciousness*.

<sup>4</sup> Although two letter units of the identical letter do exist in Hebrew, we do not calculate the appearances of double letters, since the rule in Hebrew is that when a letter is repeated it is merely reinforcing its own separate meaning (as mentioned in the previous footnote) and does not convey any new significance as a pair.

<sup>5</sup> Although there are 1,540 different possible root-combinations, not all of them carry meaning (and certainly not all of the 6 permutations of each three-letter combination). In the future, one of the innovations of the Mashiach will be to teach the meanings of these roots.

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<sup>6</sup> The *alef*, the first letter of the Hebrew alphabet, usually has a numerical value of 1, however, its very name, *alef*, can be read as *elef*, meaning one thousand, and this is sometimes used as the numerical value of *alef* in place of 1.

<sup>7</sup> A triangular number ( $\Delta n$ ) is the sum of integers from 1 to n.

<sup>8</sup> Another method of calculating the triangle of an odd number is by multiplying it by its mid-point. In this case:  $55 \cdot 28 = 1540$ .

<sup>9</sup> A few words about the numbers in this series: 10 is  $\Delta 4$  and  $\Delta_2 3$  (the tetrahedron of 3). Concerning the universal use of the decimal system, one unique phenomenon about the number 10 is that it is the first number after 1 that is simultaneously a triangle and a tetrahedron. 120 is  $\Delta 15$  and  $\Delta_2 8$  (the tetrahedron of 8). 120 has a third important property; it is also  $5!$  (meaning that it is the number of possible permutations of 5 letters—an important property of 120 in Kabbalah). This is the only number that has all three of these properties.

<sup>10</sup> When something occurs three consecutive times it is considered in Jewish law to be a *chazakah*, a fixed rule, proving its authenticity.

<sup>11</sup> These 11 are  $10 \cdot 1$  as mentioned.

<sup>12</sup> In classic Kabbalistic texts these are referred to as the 22 alphabets of our Father Abraham, the author of *Sefer Yetzirah*, as noted.

<sup>13</sup> Jeremiah 25:26 and 51:41

<sup>14</sup> Each of the seven lower sefirot has an archetypal soul-root that corresponds to it, as follows: loving-kindness: Abraham; might: Isaac; beauty: Jacob; victory: Moses; acknowledgment: Aaron; foundation: Joseph; kingdom: King David.

<sup>15</sup> Those four letters are א, ה, ו, י, which have numerical values of 1, 5, 6, and 10 respectively. The sum of these four numbers is  $1 \cdot 5 \cdot 6 \cdot 10 = 22$ , paired reflectively: the two "extremes" (from 1 to 10),  $1 \cdot 10 = 11$  and the two "middles,"  $5 \cdot 6 = 11$ .

<sup>16</sup> *Ubar* is spelled *ayin bet reish*, including the sub-root *bar*, however the *ayin* is a cruder form than the letter *alef*, signifying the un-clarified form of the embryo before its completed development.