

# LIFE SCIENCES: TORAH TAXONOMY

from Harav Yitzchak Ginsburgh

## Introduction

The subject of our inquiry is taxonomy, the science of classification, specifically of the living organisms on Earth.

Classification is predicated on the observation that of the myriad life-forms that God has created in our world, many possess similarities to one another. There are similarities of greater degree and of lesser degree.<sup>1</sup> Science endeavors to group these similarities into more general categories and by doing so to classify the tremendous variety of creatures that God has created in our world into families of related organisms.

Because taxonomy is today a science in itself, like any other scientific or intellectual investigation, it too must have its origin in the Torah. Since it has to do with creation, we also expect that its source be in the first part of the Torah, in the account of creation. As we shall see later on, this is indeed the case.

The present study is divided into two parts. Part 1 begins by looking at the relativistic nature of every classification system and the hierarchy on which it is based. It then goes on to look at the Hebrew translations for the words “Species” and “Genus.” Next, we will see a two part definition for the meaning of the Hebrew translation of “species.” We will then proceed to discuss, translate into Hebrew, and correspond to the *sefirot*, the 10 level taxonomical system currently used in biology for classifying living organisms.

In part 2, we will survey the use of the Hebrew word for “species” (מין) in both the Written Torah (the Five Books of Moses) and the Oral Torah. We will finish by introducing a Kabbalistic model for defining species.

## The relativistic nature of classification

We begin our journey into classification with a look at how the medieval Jewish philosophers treated this topic, its terminology, and usage. Much of Jewish philosophy written in the Middle Ages was in Arabic, because that was the language of philosophy at the time. A particular family of scribes, the Ibn Tibbon family, is famous for their translations of the major works of Jewish philosophy of the time from Arabic into Hebrew.



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As a general introduction to his work Shmu'el Ibn Tibbon,<sup>2</sup> wrote a short work called *Perush Milot Zarot* (Explanation of Foreign Words), in which he defines and explains all of the basic words and concepts found throughout the different philosophical texts. There are few hundred of these that appear in his introduction, and they are considered basic for understanding Jewish philosophy. Many of these terms are of course Hebrew renditions of terms that appeared originally in Greek philosophy (with which the Jewish Medieval philosophers were intimately familiar). But, obviously, once these words and concepts were translated into Hebrew, their Hebrew renditions permit us to grasp greater depth and many more dimensions of understanding and meaning within each.

Significantly, the very first two concepts that Ibn Tibbon defines are the two basic words used in classification: “species,” which in Hebrew is a “meen” (מין, plural form is *meeneem*, מינים) and “category,” which in Hebrew is “soog” (סוג, and the plural form is: *soogem*, סוגים).<sup>3</sup> The relationship between these two concepts is, as we would expect a hierarchal one, namely species is always under category.

Now, it would seem that having only two words for use in classification is limiting. Without yet going into the particulars, biologists today define 9 distinct levels used to classify life-forms. However, it is very important to remember that classification is always relative. Ibn Tibon notes that used properly, because of the relativity of every classification, two terms should suffice in clearly defining any species. Similarly, in order to identify a particular species, scientists use what is called a binomial nomenclature, noting, in order, the genus and species of the specimen. For this purpose of course, even the sole two terms *meen* and *soog* are sufficient, as Ibn Tibon notes.

To use these two words properly, we must understand that they can be used not only as the translations of Species and Genus (two levels in modern biological taxonomy), but as relative terms that can be used in a relative fashion at any level of a taxonomy in order to differentiate between the levels. This is similar to the use that Kabbalah makes of many other terms and concepts which repeat in many different contexts, each time retaining the relationship between them.

## Etymology

Let us now go back to the Hebrew word for “species,” מין. What does this word mean?

Most of the traditional Hebrew grammarians base their explanation of this word on its meaning in other Semitic languages. Because ultimately all the languages derive from the primordial language of the Torah—Hebrew, the language of creation—it is possible to gain insight into a Hebrew word by studying its meaning in the languages that still retain the same form, the Semitic languages. Thus, based on the meaning of the word in other Semitic languages, the traditional grammarians explain that this word means “imagination of the heart.” Specifically, they state that the word “species” in Hebrew

comes from the heart's ability to compare and classify different things under one common heading or picture.

In modern biology there is a great deal of debate still going on about how to classify species. The simplest, most straightforward definition has to do with fertile reproduction, but there are approximately ten other definitions. Such a great deal of disagreement implies that indeed the concept of species is inextricably linked with the subjective understanding (the imagination of the heart) of each scientist. Since classification is at the heart of biology, this is one of the reasons that physicists dislike biology—they feel that there is too much subjectivity involved and too little objectivity. When you get to chemical biology, things become more objective. But, classification depends a great deal both on the mind and on the imagination. In Hebrew, the word for imagination (דמיון) literally means “likeness,” or “similarity.”

So this is our first point about classification that we learn from the Hebrew word for “species.” When biologists would like to classify species, to define life-forms (all the more so when they begin to talk about the evolution of species—an even more problematic schema), more so than in any other aspect of science, they are projecting their power of imagination from the heart. The term that is used in the Hebrew grammar books to explain the word “species” (מין) is בדר מלב, meaning “the conjecture of the heart.”

The Torah tells us that Adam was the first taxonomist, as he was the first to call animals by names. The name “Adam” itself stems from the Hebrew word for “likeness” (as he was created “in the likeness of God”). Thus, in order to classify the species of animals and call them by name, Adam was calling upon the wisdom of his own heart. All this, the Torah relates, occurred before Adam ate from the Tree of Knowledge of Good and Evil. The first time that the word “species” appears in the first account of creation in the Torah is in relation to trees. It is easy therefore to understand that when Adam ate from the forbidden fruit of the Tree of Knowledge of Good and Evil, he lost his pristine state of being able to make proper associations; he lost his ability to properly categorize and put things together.

Besides the grammarians' proof from other Semitic languages that “species” means “conjecture of the heart,” where in the Torah do we indeed see that this is the correct meaning of this word? The real proof of this in Hebrew is that the root of the word “species” (מין) is the same as the root of the word for “picture” or “image” (תמונה). So the idea is that specimens of a particular species have the same “picture.” The concept species as defined by a picture is used by many modern biologists to define species. This definition is usually in disagreement with the definition of species as based on the ability to reproduce fertile offspring. Picture does not always imply physical form. It can also refer to a genetic picture. There are many taxonomies that define species based on genetic similarity—meaning that the DNA's are similar enough, regardless of whether fertile reproduction is possible.

(עשה), which implies improvement, almost an evolutionary vision of creation. But, in the second account, the Torah uses an intermediate form of creation, “formed” (יצירה).

This difference in verbs choice appears specifically in relation to man. When God first speaks of man, the Torah says: “Let us make man” (according to one of the Chassidic commentaries, He was addressing all of creation, giving an even stronger association of making man with an evolutionary process of which man is the final outcome). But, then when he actually creates man the verb to create appears three times—implying that the actual creation was an act *ex nihilo*: “God created man in His image; In the image of God He created Him; Male and female He created them.”<sup>4</sup>

But, when we reach the second account of creation, we find that man was formed. And, as noted, formation is an intermediate method of creation.<sup>5</sup> Why would the first account of creation leave this verb out.

### Species and category

Let us turn to look at some linguistic and mathematical properties of the Hebrew translations of “species” and “genus.” The numerical value of the word for “species,” מין is 100, or  $10^2$ . As explained in length elsewhere, in the Torah, square numbers represent a rectified or consummate reality.

Now, if you add an *alef* (א) whose value is 1, to the word מין (species) it becomes מאין, which means “out of nothing,” or *ex nihilo*, as it is commonly known. To understand creation *ex nihilo* is the most important challenge the modern science faces today. The *alef* that we have added represents the infinite. So though מין is a 100 which is perfect, it is still missing something, the א, which represents the “from nothing.”

If we add to the word for “species” (מין) the Hebrew word used by the Medieval philosophers to denote an individual specimen, איש (pronounced: *esh*), we will get איש מין, the letters of which permute to spell the complete Hebrew idiom יש מאין, meaning “something from nothing.” The species, thanks to its ability to reproduce in a fertile manner exhibits the infinite. When God created species’ he imbued them with immortality in the sense of their ability to reproduce. This is the spiritual motivation that underlies the inclusion of the ability to produce fertile<sup>6</sup> offspring in the definition of species. The power of fertile reproduction is called the power of the infinite in Chassidut. What this means is that though the particular specimens of each species die, the species continues thanks to reproduction, thanks to the power of the Infinite that is exercised in reproduction.

Now let us look at the word for “category” (or Genus), סוג. Its numerical value is 69. When you add them together you get 169, another square number:  $13^2$ . So from  $10^2$  we

hierarchy

becomes more and more unconscious. We understand that this collective consciousness governs the total behavior of all those creatures classified under one heading.

### Modern biological taxonomy

Now, let us look at the normal biological classification, and give each one a Hebrew translation. We are looking for the words that are the closest to the English term.

- **Species:** we have already seen the medieval translation of this word as *meen* (מין).
- **Genus:** Like species, we have seen its Medieval translation, which is סוג, pronounced *soog*. Since the first philosophical principle, as we saw, is the relativity of species and category, this seems to echo the scientific requirement that when stating the classification of any creature you have to state (at least) both its species and its genus. This is sufficient in order to define a given creature.
- **(Tribe):** Certain texts add this level in between the Genus and the Family. Interestingly, biologists put tribes under family, while based on the Torah we would think that the opposite is the case, as every tribe has many families. For now, we will leave this level out as it is simply a sub-division and there are many such sub-divisions possible. The Hebrew word is straightforward, שבט, pronounced *shevet*.
- **Family:** The Hebrew word for this level is also straightforward, במשפחה, pronounced: *mishpachah*.
- **Order:** We translate this as סדר, pronounced: *seder*. Now in English, the word "order" implies either what comes first and what comes second, or, as it is used in the context of classification, it implies an interrelated group. The Hebrew word סדר, also carries both meanings. On the one hand it refers to the order of things. But, on the other, it also implies the relationship between many things placed together. One example of this second meaning is found in the Passover Seder, where we place many things on the table and they have a particular relationship to one another. We can say that the first meaning implies a linear relationship (first, second, etc.), while the second implies a more complex relationship. As we shall see, using a very straightforward correspondence, the level of order corresponds to the *sefirah*

elf implies the coming together of many colors to form one beautiful whole. An example of an order is the carnivores, an order of the class of mammals.

- **Class:** We translate this as קבוצה (pronounced: *kevutzah*). An example is mammals.
- **Phylum:** We translate this as אימה (pronounced: *umah*) which literally means a nation, as the nation is under the kingdom.
- **Kingdom:** Translated as ממלכה (pronounced: *mamlachah*). Note that this is not what we would have expected, because kingdom is the English translation of the word מלכות. But, as we shall see there is a reason for this.
- **Domain:** This is a relatively newer level of classification. For instance, the animal and vegetable kingdoms both belong to the same domain. There are other domains such as molecular organisms, which are neither vegetable nor animal. Nowadays, scientists identify either 3 or 4 different domains. Before the use of domains you could be either a botanist (studying the vegetable kingdom) or a zoologist (studying the animal kingdom). But, now, these two occupations have something in common. Sometimes a Domain is called an Empire. How should we translate this word into Hebrew? In the Torah we have the concept of kings and kings of kings. Clearly, the kings correspond to the level of kingdom, while the Domain or Empire is like a kingdom of kingdoms. God is called the King of the kings of kings, and His kingdom is described as the Your kingdom is the kingdom of all worlds, where the Hebrew idiom uses the word מלכות, to designate “the kingdom [of all worlds].” So we will use the word מלכות (pronounced: *malchut*) to translate Domain.
- **Life:** This is the highest level of the modern classification scheme, as we are only contemplating living organisms. Of course, the translation of this word is straightforward, חיים (pronounced: *chayem*). God is described as the source of all life in the verse: “For with You is the source of all life.”<sup>7</sup> In Chassidut, it is explained that this verse refers to the level of pleasure in the *sefirah* of crown. Thus, there is a simple definition that all life sprouts out of the pleasure principle, which is the intermediate level of the *sefirah* of crown.

Now, let us correspond these 10 levels of classification to the *sefirot*:<sup>8</sup>

	<b>crown</b>	
	Life (pleasure) – חיים	
<b>Understanding</b>		<b>Wisdom</b>
Kingdom – ממלכה		Domain – מלכות
<b>Might</b>		<b>loving-kindness</b>
Class - קבוצה		Phylum - אומה
	<b>beauty</b>	
	Order – סדר	
	<b>victory and acknowledgment</b>	
	Family – משפחה (and Tribe – שבט)	
	<b>foundation</b>	
	Genus - סוג	
	<b>kingdom</b>	
	Species – מין	

Clearly, this correspondence requires in-depth explanation, which we will leave for another opportunity. What we will note right now though is an astounding numerical signature that this model contains. If we add the numerical values of all 10 Hebrew words that we have used, we will find that their sum is exactly 1820:

$$\text{חיים מלכות ממלכה אומה קבוצה סדר משפחה סוג מין} = 1820$$

As discussed elsewhere in length, 1820 is one of the most significant numbers in the Torah as it is the number of times that the essential Name of God, *Havayah* (the Tetragrammaton) appears in the Pentateuch. It is also the product of 26 and 70,<sup>9</sup> the numerical values of *Havayah* (י-הוה) and the word “secret” (סוד), which alludes to the verse: “The secret of [God’s Name] *Havayah* is to those who fear Him.”<sup>10</sup>

## Species in the Written Torah

Any serious study of a concept in the Torah requires that we look for the concept in the text of the Bible. When we search for the word for “species” (מין) in the Pentateuch we find it clustered in 3 different locations:

- In the first account of creation.
- In the description of the animals that were taken aboard Noah’s ark.
- In the dietary laws of *kashrut* that differentiate between animals whose consumption is permissible and those which are prohibited.

Our methodology will be to first look at each of these clusters separately and then try to understand the relationship between them.

## The species of creation

As we noted above, since classification has to do with creation, it is not surprising that this word appears in the Genesis account of creation. Significantly, the word for species appears exactly 10 times in the first account of creation. God created the world with 10 utterances. Though these 10 instances do not appear in the wording of the 10 utterances, the similarity in number implies that there is an important relationship between the two, one whose development we set aside for now. In addition, as noted earlier, the word for “species,” מין, equals  $100 = 10^2$ .

Let us begin by quoting in both Hebrew and English translation the verses in which the word “species” appears. The superscript notations indicate the particular inflection of each instance of “species,” where m denotes the masculine form; f the feminine form; pl, the plural (masculine form, as there are no feminine plural forms); and, m,c denotes the masculine complex form (למינהו):

Third Day	(v. 11) God said: “Let the earth bring forth grass, herb yielding seed, and fruit tree that yielding fruit after its <b>species</b> <sup>m</sup> , whose seed is in itself upon the earth”; and it was so.	(יא) וַיֹּאמֶר אֱלֹקִים תִּדְשָׂא הָאָרֶץ דְּשֵׂא עֵשֶׂב מְזֵרִיעַ זֶרַע עֵץ פְּרִי עֵשֶׂה פְּרִי לְמִינֹו אֲשֶׁר זָרְעוּ בּוֹ עַל הָאָרֶץ וַיְהִי כֵן.
	(v. 12) The earth brought forth grass, herb yielding seed after its <b>species</b> <sup>m,c</sup> , and tree yielding fruit, whose seed was in itself after its <b>species</b> <sup>m,c</sup> ; and God saw that it was good.	(יב) וַתּוֹצֵא הָאָרֶץ דְּשֵׂא עֵשֶׂב מְזֵרִיעַ זֶרַע לְמִינֵהוּ וְעֵץ עֵשֶׂה פְּרִי אֲשֶׁר זָרְעוּ בּוֹ לְמִינֵהוּ וַיֵּרָא אֱלֹקִים כִּי טוֹב.
Fifth Day	(v. 21) God created the great serpents and every living creature that creeps, which the waters had brought after their <b>species</b> <sup>pl</sup> , and every winged bird after its <b>species</b> <sup>m,c</sup> ; and God saw that it was good.	(כא) וַיִּבְרָא אֱלֹקִים אֶת הַתַּנִּינִם הַגְּדֹלִים וְאֶת כָּל נֶפֶשׁ הַחַיָּה הַרְמֶשֶׂת אֲשֶׁר שָׂרְצוּ הַמַּיִם לְמִינֵהֶם וְאֶת כָּל עוֹף כַּנָּף לְמִינֵהוּ וַיֵּרָא אֱלֹקִים כִּי טוֹב.
Sixth Day	(v. 24) God said: “Let the earth bring forth living creatures after their <b>species</b> <sup>f</sup> , cattle and creeping things, and beasts of the earth after their <b>species</b> <sup>f</sup> ; and it was so.	(כד) וַיֹּאמֶר אֱלֹקִים תּוֹצֵא הָאָרֶץ נֶפֶשׁ חַיָּה לְמִינָהּ בְּהֵמָה וְרֶמֶשׂ וְחַיְתוֹ אֶרֶץ לְמִינָהּ וַיְהִי כֵן.
	(v. 25) God made the beasts of the earth after their <b>species</b> <sup>f</sup> and cattle after their <b>species</b> <sup>f</sup> and everything that creeps on the earth after its <b>species</b> <sup>m,c</sup> ; and God saw that it was good.	(כה) וַיַּעַשׂ אֱלֹקִים אֶת חַיַּת הָאָרֶץ לְמִינָהּ וְאֶת הַבְּהֵמָה לְמִינָהּ וְאֶת כָּל רֶמֶשׂ הָאֲדָמָה לְמִינֵהוּ וַיֵּרָא אֱלֹקִים כִּי טוֹב:



Note that the first use of the word “species” is in the third day of creation, the day on which plant life was created. Clearly, because species is a word related to life, as we explained earlier, it can only appear once life appears.

Note that the word appears in four different forms, all of which begin with the pronoun prefix letter *lamed* (ל), a point we will explore in greater depth later. The reason for these different forms (species of the word, if you will), is that Hebrew is a highly inflected language that differentiates between masculine and feminine forms of possession words. The four different forms are:

- למינו – 1 appearance – masculine singular possessive form.
- למינהו – 4 appearances – masculine singular composite possessive form.
- למיניהם – 1 appearance – masculine plural possessive form.
- למינה – 4 appearances – feminine singular possessive form.

On the third day of creation the word appears 3 times. On the fourth day there is no mention of this word, since the fourth day does not deal with the creation of life. On the fifth day, which relates the creation of birds and fish, “species” appears 2 times. Finally, on the sixth day, the word appears 5 times.

Now, if we look at the subject of each appearance of species, we will see that 3 of them are vegetable species and 7 are animal species. The 7 animals themselves divide into 2 and 5—2 on the fifth day and 5 on the sixth day.

Note that in regard to man species is not mentioned. It may be even inappropriate to refer to man as a species because man is said to have been created in the image of God.

## Species in the account of Noah and the flood

The second cluster of the word “species” appears in the Torah’s account of the flood. Noah was commanded by God to take all the different species of life into the ark in order to save them from annihilation:

<p>(6:19) And of every living thing of all flesh, two of every kind you shall bring into the ark to keep them alive with you; they shall be male and female. Of birds, after their <b>species</b><sup>mc</sup>, and of cattle after their <b>species</b><sup>f</sup>, of every creeping thing of the earth after its <b>species</b><sup>mc</sup>, two of every sort shall come to you, to keep them alive....</p> <p>(7:11) In the six hundredth year of Noah’s life, in the second month, the seventeenth day of the month, on that very day, all the fountains of the great abyss were broken open and the windows of the heavens were</p>	<p>(ו, יט) ומכל החי מכל בשר שנים מכל תביא אל התבה להחית אתך זכר ונקבה יהיו. (כ) מהעוף למינהו ומן הבהמה למינה מכל רמש האדמה למינהו שנים מכל יבאו אליך להחיות....</p> <p>(ו, יא) בשנת שש מאות שנה לחיי נח בחדש השני בשבעה עשר יום לחדש ביום הזה נבקעו כל מעינות תהום רבה וארבת השמים נפתחו. (יב) ויהי הגשם על הארץ ארבעים יום וארבעים לילה. (יג) בעצם היום הזה בא נח ושמ וחס ונפת בני נח ואשת נח ושלשת</p>
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<p>opened. And the rain was upon the earth for forty days and forty nights. On that very day, Noah and Shem and Cham and Jephthe, the sons of Noah, and Noah's wife and the three wives of his sons with entered into the ark. They and every beast after its <b>species<sup>f</sup></b>, and all the cattle after their <b>species<sup>f</sup></b>, and every creeping thing that creeps on the earth after its <b>species<sup>mc</sup></b>, and every bird after its <b>species<sup>mc</sup></b>, every bird of every wing.</p>	
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In these verses, the word species appears exactly 7 times, which itself implies a correspondence with the seven Noahide laws! Now, we might ask, why only 7 times, why not 10 times as in creation (in which case they would also correspond to the 10 *sefirot*)?

The simple answer that we can give is that only life on the continents was destroyed by the flood. Marine life was not affected by the flood and these are the 3 additional “species” that Noah did not have to bring with him on the ark. [As explained elsewhere,<sup>11</sup> the three great oceans of the world correspond to the three supernal *sefirot*, thus implying that ocean or marine life does indeed correspond to three of the 10 *sefirot*!]

A second explanation, following the 10 appearances of “species” in the first account of creation more closely, would be that Noah was not commanded to save plant-life aboard the ark in order to save it because plants grew again naturally after the flood. As we mentioned earlier, the first 3 instances of species in the first account of creation is in regard to plants. The plants did not need to be saved in Noah's ark, as we see that they re-grew after the flood ended.<sup>12</sup>

In any event, three of the ten species do not reappear in the context of Noah and the flood. Elsewhere,<sup>13</sup> we have discussed in length the intrinsic relationship between the rectification of all of mankind and the number 7, which is reflected time and again in the story of the flood. For instance, there are seven colors in the rainbow—the covenant between God and mankind—the word “covenant” appears seven times in the description of the covenant,<sup>14</sup> and so on. One thing that we did not mention there was that the word species appears 7 times.

### The species of the dietary laws

The third context in which “species” appears is in the laws of *kashrut*, the dietary laws of the Torah. The Torah prescribes that Jews may eat only certain species of birds and animals. The laws that differentiate between pure and impure animals appear twice in the Torah, once in *parshat Shemini* in Leviticus<sup>15</sup> and once in *parshat Re'ei* in Deuteronomy.<sup>16</sup>

Leviticus	<p>(11:13) And among birds, you shall hold these in abomination; they shall not be eaten; they are an abomination: The eagle [or the griffin vulture], the kite, the osprey, (v. 14) the kestrel, and the vulture after its <b>species<sup>f</sup></b>, (v. 15) and the raven after its <b>species<sup>m</sup></b>, (v. 16) the ostrich, the jay, and the sparrow hawk, and the goshawk after its <b>species<sup>mc</sup></b>; (v. 17) The owl, the gull, the little owl; (v. 18) The bat, the starling, the magpie; (v. 19) the stork, the heron after its <b>species<sup>f</sup></b>; the hoopoe and the <i>atalef</i> [bat?]; (v. 20) Any flying insect that walks on four, is an abomination for you. (v. 21) However, among all the flying insects that walk on four [legs], you may eat [from] those that have jointed [leg like] extensions above its [regular] legs, with which they hop on the ground. (v. 22) From this [locust] category, you may eat the following: The red locust after its <b>species<sup>m</sup></b>, the yellow locust after its <b>species<sup>mc</sup></b>, the spotted gray locust after its <b>species<sup>mc</sup></b> and the white locust after its <b>species<sup>mc</sup></b>....</p> <p>(v. 29) And this is unclean for you among creeping creatures that creep on the ground: The weasel, the mouse, and the toad after its <b>species<sup>mc</sup></b>.</p>	<p>(יא, יג) וְאֵת אֱלֹהֵי תְשַׁקְצוּ מִן הָעוֹף לֹא יֵאָכְלוּ שֶׁקֶץ הֵם אֵת הַנְּשָׁר וְאֵת הַפֶּרֶס וְאֵת הָעֹזְנִיָּה. (יד) וְאֵת הַדָּאָה וְאֵת הָאֵיָּה לְמִינָהּ. (טו) אֵת כָּל עֹרֵב לְמִינוֹ. (טז) וְאֵת בַּת הַיַּעֲנָה וְאֵת הַתְּחֻמָּס וְאֵת הַשְּׁחָף וְאֵת הַנֶּנֶץ לְמִינֵהוּ. (יז) וְאֵת הַכּוֹס וְאֵת הַשְּׁלֵף וְאֵת הַיִּנְשׁוּף. (יח) וְאֵת הַתְּנַשְׁמַת וְאֵת הַקָּאֵת וְאֵת הָרְחָס. (יט) וְאֵת הַחֲסִידָה הָאֲנָפָה לְמִינָהּ וְאֵת הַדּוֹכִיפַת וְאֵת הָעֵטְלָף. (כ) כָּל שָׂרָץ הָעוֹף הַהֶלֶךְ עַל אַרְבַּע שֶׁקֶץ הוּא לָכֶם. (כא) אִךְ אֵת זֶה תֹאכְלוּ מִכָּל שָׂרָץ הָעוֹף הַהֶלֶךְ עַל אַרְבַּע אֲשֶׁר לוֹ כַרְעִים מִמֶּעַל לְרַגְלָיו לְנֹתֵר בָּהֶן עַל הָאָרֶץ. (כב) אֵת אֱלֹהֵי מַהֵם תֹּאכְלוּ אֵת הָאֲרָבָה לְמִינוֹ וְאֵת הַסְּלֵעַם לְמִינֵהוּ וְאֵת הַחַרְגֵּל לְמִינֵהוּ וְאֵת הַחֲגָב לְמִינֵהוּ....</p> <p>(כט) וְזֶה לָכֶם הַטָּמֵא בְּשָׂרָץ הַשָּׂרָץ עַל הָאָרֶץ הַחֲלָד וְהָעֶכְבֵּר וְהָצָב לְמִינֵהוּ.</p>
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Deuteronomy	<p>(14:12) But these are those from which you shall not eat: The eagle [or the griffin vulture], the ossifrage, the osprey; (v. 13) and the white vulture, and the black vulture, and the kite after its <b>species<sup>f</sup></b>; (v. 14) And every raven after its <b>species<sup>m</sup></b>; (v. 15) And the ostrich, and the screech owl, and the gull, and the hawk after its <b>species<sup>mc</sup></b>; (v. 16) The little owl, the great owl and the white owl; (v. 17) And the pelican, and the magpie, and the cormorant; (v. 18) And the stork, and the heron after its <b>species<sup>f</sup></b>, and the hoopoe, and the bat.</p>	<p>(יד, יב) וְזֶה אֲשֶׁר לֹא תֹאכְלוּ מֵהֶם הַנֶּשֶׁר וְהַפֶּרֶס וְהַעֲזֹנִיָּה. (יג) וְהָרָאָה וְאֵת הָאֵיָהּ וְהַדִּיהָ לְמִינָהּ. (יד) וְאֵת כָּל עֹרֵב לְמִינוֹ. (טו) וְאֵת בֵּת הַיַּעֲנָה וְאֵת הַתְּחֻמָּס וְאֵת הַשְּׁחָף וְאֵת הַנֶּנֶץ לְמִינָהּ. (טז) אֵת הַכּוֹס וְאֵת הַיִּנְשׁוּף וְהַתְּנַשְׁמֶת. (יז) וְהַקָּאֵת וְאֵת הַרְחֻמָּה וְאֵת הַשְּׁלֵף. (יח) וְהַחֲסִידָה וְהָאֲנָפָה לְמִינָהּ וְהַדּוֹכִיפֵת וְהָעֵטְלָף.</p>
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We see that in Leviticus (*parshat Shemini*), the word species appears 9 times while in Deuteronomy (*parshat Re'eih*) it appears 4 more times. Altogether in the context of *kashrut*, "species" appears 13 times. The division of 13 into 9, 3<sup>2</sup>, and 4, 2<sup>2</sup> (the division which defines 13 as an inspirational number), echoes the structure of the word אחד, meaning "one," whose numerical value is 13. Though the word "one" would seem to indicate absolute unity and singularity (which it does), paradoxically, the Arizal explains that it has two dimensions in it: a relatively male dimension and a relatively female dimension. The first two letters, אה, equal 9, and by themselves mean "brother"<sup>17</sup>; this is the male element. In the Torah scroll, the last letter, ד, whose numerical value is 4, is written extra large and alludes to the feminine aspect of reality. The number 4 itself, as explained by the sages hints at the four extremities of reality (North, South, East, and West) and the name of the letter "dalet" is written and also stems from the same root as the Aramaic word "דלית" (*deleit*), alluding to the *Zohar's* description of the yet unrectified feminine aspect as "she has nothing of her own."

This same structure is exhibited in the two appearances of these dietary laws. In general, whenever a law is repeated twice in the Torah, the first appearance describes its relatively masculine aspect while the second appearance relates to its relatively feminine aspect. In this particular case, the correspondence is even stronger, since between the Five Books of Moses, Deuteronomy, the fifth and final book, represents the feminine aspect of Moses' prophecy, while the first four books, including Leviticus represent its male aspect.<sup>18</sup> So the concept of species appears 9 times in the male dimension of the laws of species *kashrut* and 4 times in the female dimension of the same laws.

So let us summarize, we have found the word species 10 times in creation, 7 times in the flood, and 13 times in relation to the laws of *kashrut*. One of the most ubiquitous pairs of

So altogether, we find the word “species” 30 times in the Torah. Yet, note that in all 30 instances, the simple noun “species” (מין) does not appear even once. All 30 instances are conjugated forms of the noun. In fact, all 30 times, the word appears with a prefix letter *lamed* (ל), transforming it to mean “after its species.” The numerical value of ל is 30, alluding, through self-reference, to the 30 appearances of this word in the Torah!

Now, why does the word “species” begin with the letter *lamed*? Going back to our etymological discussion of the word “species,” recall that it means “the conjecture of the heart.” Putting both meanings together, we might even say: the conjecture of the heart as it is photographing (that is imaging) reality, and thereby attempting to classify reality. The conjecture of the heart in Torah refers specifically to the letter *lamed*, since the idiom that the letters of the name of the *lamed* spell (למד) is “a heart that understands knowledge” (לב מבין דעת).<sup>20</sup> Knowledge here refers the rectified power of imagination which permits a person to correctly classify things in the order of species and genus.

Additionally, that the final 13 instances of the word “species” in the Torah are in the context of *kashrut*, this implies that the final rectification of all species and also the power of imagination required for classifying them correctly, is connected with proper eating habits—i.e., eating only that which the Torah permits and refraining from what it forbids. Let us follow our reasoning here a bit more explicitly. We saw that in the context of creation the word appears 10 times, in a simply descriptive manner (without prescribing permissible and forbidden species for consumption). Then in the context of the flood it appears 3 less times, indicating that there was some kind of detracting from the original created state of the species. According to the sages, the flood came as a punishment and a rectification for the abominable behavior of both men and animals, behavior that included forbidden procreative acts between animal species and between humans and animals. But, then in the context of the laws of *kashrut*, the three species that were detracted are returned to the original 10 giving us a total of 13 repetitions of the word and indicating that this is the final rectification of the concept. So when a person eats properly, he corrects his power of imagination and can correctly conceptualize the relationship (be it morphological, genetic, or any other type of relationship) between the species. Eating properly here also includes the pertinent intentions that one should have during eating.<sup>21</sup> Improper consumption of food, damages one’s power of imagination. Case in point would be the theory of evolution, which when severed from the full gamut of the origin of species described in the Torah and described elsewhere,<sup>22</sup> illustrates a damaged power of imagination.<sup>23</sup>

## Species in the Oral Torah

So far we have examined the concept of species as it appears in the Written Torah. How is this concept used in the Oral Torah? Let us look at the various instances that this word is used in the Oral Torah. We will order our observation by the number of species in each instance. Interestingly, we do not find that one, two, or three types of some plants or animals are described as species in the Oral Torah. The smallest number described as species is four. Even more interesting, as we shall see, is that the species is used in the Oral Torah always in reference to types of plants, members of the vegetable kingdom. This echoes the fact that the concept of species in the Written Torah (in the account of creation) began with the vegetable kingdom as well.

- **Four Species:** On *Sukot*, the Torah commands us: “You shall take unto yourselves on the first day the fruit of the citron, a branch of the date palm, branches of the threaded tree [myrtle] and branches of the willow, and you shall rejoice before God for seven days.”<sup>24</sup> Interestingly, the Torah does not use the word species to describe these four types of plants, but we are all familiar with the concept of the Four Species, which is how they are referred to in the Oral Torah.
- **Five Species:** There are five types of grain that when baked they are considered to be bread, which requires us to recite the blessing over bread when eating them and recite the grace after meals after eating them.<sup>25</sup> These five types of grain (or produce) are alluded to beautifully in the beginning of the second of creation which begins with five words whose initials spell the word for תבואה, meaning “produce” (אלה תולדות השמים והארץ בהבראם). The letter that immediately follows the initial letter of the last word needed to spell “produce”—the ב of בהבראם—is the famous small *hei* (ה) of בהבראם,<sup>26</sup> whose numerical value is of course 5, alluding to the five species of produce. Note that in this case, each of the five species is actually a super-species, or a Genus in modern scientific terminology. As we said, the concepts of species and genus in Torah are actually relative.
- **Seven Species:** The Torah describes the Land of Israel as, “A land of wheat and barely and of grapevines and figs and pomegranates, a land of olive oil and honey [of date palms].”<sup>27</sup> This verse describes the seven species of plants with which the Land of Israel is blessed.

## The mathematics of species in the Oral Torah

So now we have seen that the Oral Torah mentions species in relation to the numbers 4, 5, and 7. Let us take these three numbers and, using the method of finite differences, form a quadratic series from them:

4	5	7	10	14	19
	1	2	3	4	5
	1	1	1	1	

It is easy to see that the numbers of these series are generated by the function:

$$f[n] = \Delta n + 4$$

where  $\Delta n$  denotes the sum of integers from 1 to  $n$ , the triangle of  $n$ .

Now the 12<sup>th</sup> number in this series will be  $\Delta 11 + 4$ , or 70. Since this series describes the various numbers of species in different significant grouping, where do we find 70 species of anything in the Torah?

After the Exodus and the splitting of the Red Sea, the Torah relates that the Jewish people: "They came to Eileemah where there were 12 springs of water and 70 date palms..."<sup>28</sup> One of the earliest texts of Kabbalah, which precedes even the holy *Zohar*, is the *Bahir*, whose name means the Book of Brilliance (another synonym for "light"). The *Bahir* notes that this was the first sight that the people saw after the splitting of the Red Sea on their journey to the Land of Israel. Eileemah was a desert oasis with 12 different springs of water. What the *Bahir* adds is that the 70 date palms were not 70 specimens of the same species of palm tree, but rather 70 unique species of palm tree. So the first thing that the Jewish people did after being freed from the slavery of Egypt was species classification.

### The criteria for species in Kabbalah

But the most important thing that the *Bahir* adds is a very insightful definition of the basis of their classification of the date palms as being different. The *Bahir* gives us three criteria by which the people justified the classification of each type of date palm as a separate species:

1. "They were not similar to one another" (לא דמתה זו לזו). This criteria corresponds to a morphological distinction.

2. "They functioned differently" (לא דמתה פעולת זו לזו). Functional distinction includes but is not limited to each date palm's reproductive method. This is an expansion of the present working definition of species usually used in biology. Clearly one of the most important things to study is mating habits, but this also includes all the behavior of the particular specimen.

3. "Their fruit tasted different" (לא טעם זה כטעם זה). One might initially be surprised that a palatable distinction serves as a criteria for species-hood. However to appreciate this final criterion one must know that in Kabbalah, taste represents the spiritual aspect, i.e., the very essence of a tree that bears edible fruit.<sup>29</sup> Thus, taste represents the word of God in the fruit.<sup>30</sup> How can this criterion apply to organisms that do not bear fruit? The

According to the *Bahir*, a specimen has to be unique on all three counts in order to be considered a separate species!

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1. The word for “similarity” in Hebrew is דמיון (pronounced: *deemyon*), which also means “imagination.” As we shall see, classifying species correctly requires a rectified imagination. We have discussed this relationship and other aspects of classification in our series on evolution. See [www.inner.org/torah\\_and\\_science/exact\\_sciences/evolution\\_seminar.php](http://www.inner.org/torah_and_science/exact_sciences/evolution_seminar.php).

2. The Ibn Tibbon family was well known as the great translators (from Arabic to Hebrew) of the Middle Ages.

3. It is quite normal for philosophical concepts to appear as part of a group or system of concepts that go together. Our task is of course to understand how they relate one to another within the framework of a complete system.

4. Ibid. 1:27.

5. See in length in the 24<sup>th</sup> of Tevet lecture, 5768 ([www.inner.org/times/tevet/kafdalettevet/E68-0424.php](http://www.inner.org/times/tevet/kafdalettevet/E68-0424.php)).

6. An example of offspring that is not fertile is the mule, the product of the mating of a female horse with a male donkey.

7. Psalms 36:10.

8. See our lecture series on evolution (note 1) for another model for corresponding only part of the full modern taxonomical structure to the *sefirot*.

9. As we shall see later, 70 is the one of the most important numbers associated with classification in the Torah.

10. Psalms 25:14.

11. See in length on our website [www.inner.org/torah\\_and\\_science/exact\\_sciences/E68-0524-1.php](http://www.inner.org/torah_and_science/exact_sciences/E68-0524-1.php)

12. This correspondence is a little weaker, since the 7 “species” we are referring to in the account of creation include the fish, which as we noted, did not need to board the ark in order to be saved.

13. See *Kabbalah and Meditation for the Nations*, pp. ???

14. About this phenomenon, its meaning, and covenant numbers in general see *Ibid.*, p. ??? and in our forthcoming book on the mathematics of the Book of Genesis, *parshat Noach*.

15. Chapter 11.

16. Chapter 13.

17. See also *The Art of Education*, p. ??? . לגבי אה אחד.



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18. The sages explain that the Book of Deuteronomy was said by Moses in a series of discourses in which the Divine Presence would speak from his throat. Both the Divine Presence (the Shechinah) and speech are archetypal examples of the feminine aspect in the world.

19. See in length in our forthcoming book on the mathematics of the Book of Genesis.

20. Based on *Otiyot Derabbi Akiva*, an important *midrash* explaining the significance of the Hebrew letters.

21. See also our article on nutrition, [www.inner.org/torah\\_and\\_science/exact\\_sciences/E68-0705.php](http://www.inner.org/torah_and_science/exact_sciences/E68-0705.php).

22. See note 5.

23. See also in length in our lecture series on evolution ([www.inner.org/torah\\_and\\_science/exact\\_sciences/evolution\\_seminar.php](http://www.inner.org/torah_and_science/exact_sciences/evolution_seminar.php)).

24. Leviticus 23:40.

25. Passover *matzah* also has to be made from one of these five species of grain.

26. See also our discussion of the significance of this letter in our lectures on the number 248 ([www.inner.org/torah\\_and\\_science/exact\\_sciences/248.php](http://www.inner.org/torah_and_science/exact_sciences/248.php)).

27. Deuteronomy 8:8.

28. Exodus 15:27. See also Numbers 33:9.

29. According to this spiritual perspective, if a fruit has lost its taste it should not be consumed.

30. See also our article on nutrition: [www.inner.org/torah\\_and\\_science/exact\\_sciences/E68-0705.php](http://www.inner.org/torah_and_science/exact_sciences/E68-0705.php).

31. For instance, the sages say that in the future, all trees will bear edible fruit.