
THE TORAH UNIVERSE

THE SCIENCE OF TORAH

The Reflection of Torah in the Laws of Science, the
Creation of the Universe, and the Development of Life

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APPENDIX ONE: THE FRACTAL PATTERN OF TORAH

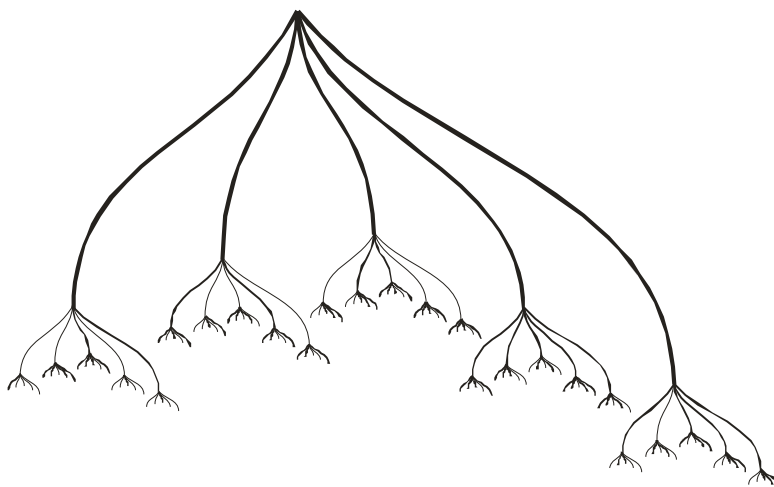
This appendix elaborates upon a concept presented in Part One, Section Three: *Patterns in the Torah* – that the Torah is structured according to a basic pattern that is repeated at different scales, similar to the fractal structure of many elements of the natural world. Rabbi Yehoshua Honigwachs, in his book *The Unity of Torah* (Feldheim Publishers, 1991), proposes that this pattern exists in the Torah; this appendix is a brief summary of that book.¹

The basic goal of Torah is to take one from being an egoistical taker to becoming a selfless giver who fully unites both with God and man. This requires five stages of growth:

- Stage One:** There must be recognition of the other's existence and right to exist.
- Stage Two:** An acceptance that the other has a sphere of influence that extends beyond themselves.
- Stage Three:** The understanding that this limits one's own activities and that one's interaction with the other must be governed by laws.
- Stage Four:** Understanding the need to cooperate with the other (principally by way of speech).
- Stage Five:** Totally unifying with the other

¹ It may be charged that the evidence for this pattern is not firm enough. The reader is invited to study it and decide for himself. In any case, the validity of this model is not axiomatic to either Jewish belief or the rest of this book.

The five-stage pattern develops a process of growth, taking one from the extremes of egotism toward absolute dedication to God and to mankind. This five-part structure exists at many different levels. It is found with the two tablets (each containing five commandments), with the five books of the Torah, within the individual books, and within the individual fifths of these books. The same pattern is repeated at different scales, as represented in the following diagram.



We shall first see how these five stages are manifest in the Ten Commandments, after which we shall explore how they are manifest at various scales in the Torah.¹

The Five Stages in the Ten Commandments

The Ten Commandments were given as two tablets, each of which contained five commandments. Placed side by side, each commandment has a corresponding commandment on the other tablet:

¹ They are also manifest in the five Biblical festivals and in the five stages of marriage, but that is beyond the scope of this work.

1. I am God	6. Do not murder
2. You shall not have other gods	7. Do not commit adultery
3. Do not take God's Name in vain	8. Do not steal (kidnap)
4. Sanctify the Sabbath	9. Do not bear false witness
5. Honor your parents	10. Do not covet

This means that rather than being a series of ten laws, they should be viewed as a single series of five laws that has two manifestations. The five stages of growth are manifest in their application to achieving unity with God on one tablet, and in their application to achieving unity with man on the other.

Stage One requires recognition of the other's existence and right to exist. Between man and God, this requires acknowledging God's existence, which is mandated by the first commandment on the first tablet. Between man and man, this requires acknowledging the other's right to life, which is mandated by the first commandment on the second tablet of not murdering.

Stage Two requires an acceptance that the other has a sphere of influence that extends beyond themselves. Between man and God, this requires one to accept that God controls the world, which is mandated by the second commandment on the first tablet of not worshipping idols. Between man and man, this requires accepting that a person's domain extends to include his spouse, and the second commandment on the second tablet is therefore the prohibition against taking another man's wife.

Stage Three translates the acceptance of the other's sphere of influence into an understanding that this limits one's own activities and that one's interaction with the other person must be governed by laws. Between man and God, this means that one may not make free use of God's Name, and is mandated by the third commandment of not using His Name in vain. Between man and

man, this curtails one’s exploitation of other people, and is reflected in the commandment prohibiting stealing; this is understood to refer to kidnapping and subsequently abusing him.

Stage Four reaches an understanding of the need to cooperate with the other, principally by way of speech. Between man and God, this means attesting to God’s mastery of the world by sanctifying Shabbos. Between man and man, this means refraining from false testimony and, by implication, harmful speech.

Stage Five is the climax in which one totally unifies with the other. Between man and God, this means understanding that one’s very existence originates in God; this is reflected in the fifth commandment to honor one’s parents, who are God’s medium for creating the person. Between man and man, this is mandated by the commandment prohibiting jealousy, the primary obstruction to achieving true unity.

Here is the pattern as reflected in the two tablets:

Beginning with: Selfishness; Isolation; Focus on the Individual

*Manifestation between
Man and God*



*Manifestation between
Man and Man*

TABLET #1	DEVELOPMENT	TABLET #2
Accepting God <i>Acceptance of God’s existence</i>	STAGE ONE <i>Acceptance of others’ existence</i>	Do Not Murder <i>Other people’s right to exist; Value of life</i>
Do Not Worship Idols <i>Accepting God’s ownership of the entire universe</i>	STAGE TWO <i>Acceptance of their domain</i>	Do Not Commit Adultery <i>Accepting the other person’s domain</i>
Do Not Take God’s Name in Vain <i>No unlawful use of God’s Name</i>	STAGE THREE <i>No unlawful use of property (lawful coexistence)</i>	Do Not Steal (Kidnap) <i>No unlawful use of another’s being, person or property</i>

<p>Observing Shabbos <i>Testifying to God's authority</i></p>	<p>STAGE FOUR <i>Readiness to cooperate (particularly through speech)</i></p>	<p>Do Not Testify Falsely <i>No destructive talk; hence, cooperate</i></p>
<p>Honoring Parents <i>Unity with one's source</i></p>	<p>STAGE FIVE <i>Total unity</i></p>	<p>Do Not Covet <i>No resentment of others</i></p>



Climaxing with: Selflessness; Unity with God and man; Integration into the Community

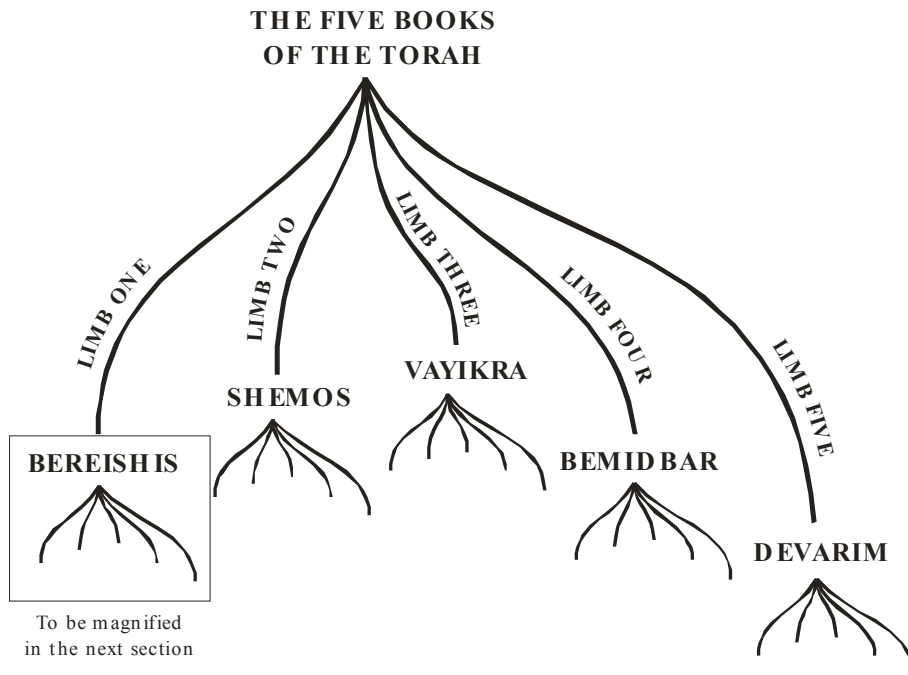
The Five Stage Pattern of Torah

This five-stage pattern also occurs at various scales in the Torah. It charts the development of unity between man and God, and also the development of unity between man and man, as the nation of Israel developed. The sins that occurred also correspond to the themes of those stages. There are also themes that link equivalent stages at different levels; for example, the story of the Exodus in the second Book, Shemos, has matching events in the second part of the first Book, Bereishis.

In the hierarchal and unfolding structure of the Torah, we shall identify four levels. Since Torah is compared to a tree – “It is a tree of life for those that support it” (Proverbs 4:2) – we shall describe this pattern in terms of the unfolding pattern of a tree: limbs, branches, twigs, and stems. Space does not permit us to follow all the unfolding paths. Instead, we shall follow the unfolding pattern of the first limb, and then the unfolding pattern of the first branch in that limb, followed by the unfolding pattern of the first twig in that branch, followed by the unfolding pattern of the first stem in that twig; for a fuller discussion, see Rabbi Honigwach’s work.

It should be noted that the pattern is not perfectly replicated at each part of each scale. In some cases, we can see why that happened; other cases remain as a question. All this may relate to the concept of broken symmetries that are discussed earlier in this work.

A. The Five Limbs Within The Torah



Limb One: The Book of Bereishis

Bereishis launches the theme of the creation of life, and also teaches the value of the individual, in the context of the significance of the patriarchs. It relates the primal stage of the birth of a tribe that would later become a nation. The importance of the individual is also shown by the urgency of the desire of the patriarchs to have children. The major sins are Cain's murder of Abel, and the brothers' attempt to murder Yosef.

Bereishis describes how God gives existence to the universe, man and Israel. Man, in turn, begins to recognize God, and Avraham begins his mission of teaching the world that God exists.

Limb Two: The Book of Shemos

Shemos starts the basic level of nationhood. Yaakov's offspring become a fledgling nation. The laws of property rights begin to communicate the appreciation of the rights of others.

The events of Shemos show the world that Israel is in the domain of God, not of Egypt. The Exodus and the Mishkan present the themes of God's ownership of the world, with God's new open physical interaction with the world.

Limb Three: The Book of Vayikra

Vayikra demonstrates the acceptance of law by a people that was becoming more sophisticated in its understanding of nationhood. There is a restriction of human conduct in the face of the rights of other entities.

Vayikra also demonstrates the advance in the relationship between man and God, with God entering the Mishkan, and man accepting His laws.

Limb Four: The Book of Bemidbar

The events of Bemidbar demonstrate that the nation was reaching a higher level of structure, internal unity, and cohesiveness.

Bemidbar also shows that the nation was beginning to cooperate more with God and fuse with Him, as it describes the sanctification of the nation. God is now not only in the Mishkan, but also in the midst of the entire community.

Speech, which we noted to be the form of cooperation mentioned in the fourth stage, is an important theme in Bemidbar. The laws of vows, the blessings of the *sotah*, and the commandment of confession all relate to speech. The sins of Bemidbar, including the complaints, Miriam's evil talk about Moshe, the criticisms of Korach, Moshe's neglect to speak to the rock, and Bilaam's curses all relate to speech.

Limb Five: The Book of Devarim

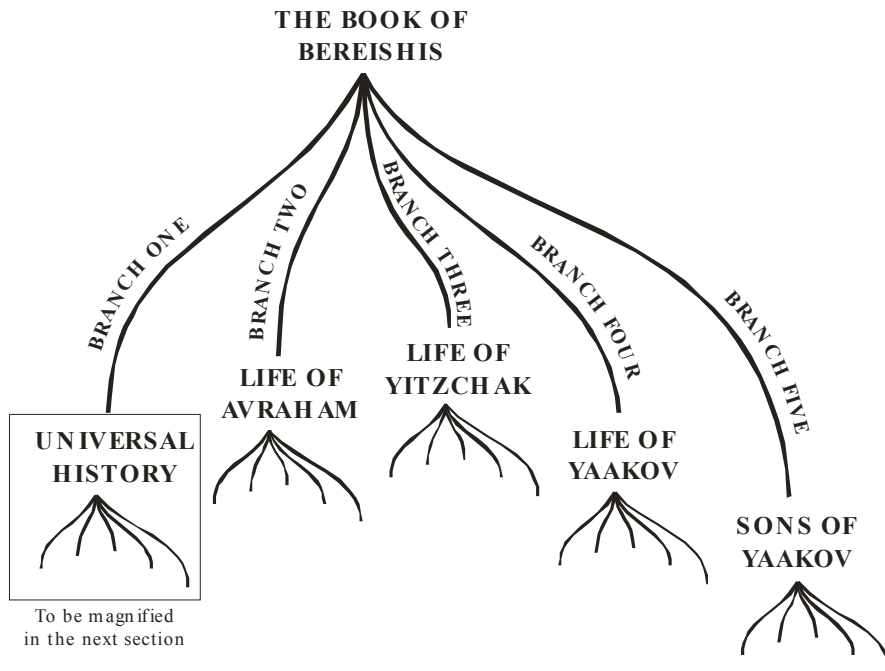
Devarim differs from the earlier books in that the people had not advanced quite as far as was hoped. The themes are therefore

reflected more in Moshe’s speech concerning his hopes for the nation. These speeches describe laws that teach unity and so on. There is a projection of the Jewish nation becoming “a kingdom of priests,” an entity in which everyone is unified with each other, and the nation is unified with God. The theme of kingdom will be reflected in stage five at various scales.

There is a strong theme of blessing, which is a stage five theme as it indicates God’s closeness with man.

B. The Five Branches On The First Limb (Bereishis)

As well as the manifestation of the five principles, there is also correspondence with the patterns in the larger structure of the five books. These are often easier to identify than the root principles.



Branch One: Universal History (Bereishis 1:1-11:32)

The first branch of Bereishis describes God's creation of the universe and the origins of mankind. This obviously corresponds to the theme of the book as a whole.

Branch Two: The Life of Avraham (Bereishis 12:1-21:34)

The events of Avraham's life, such as his exile because of famine to Egypt, his wife taken into bondage, the Egyptians subsequently punished with plague, his leaving with riches, clearly correspond to the events of Shemos.

God launched a covenant with Avraham, thereby beginning the relationship; He also launched a covenant with the Jewish people at Sinai.

Circumcision, the mitzvah inaugurating one's national identity, relates to the Pesach offering which served the same function for the Israelites.¹

The separation of Avraham from his birthplace and background corresponds to the separation of Israel as a nation dedicated to serving God.

Avraham's rejection of idolatry, and the double attempt of adultery with Sarah, clearly correspond to the second commandments of each tablet.

Branch Three: The Life of Yitzchak (Bereishis 22:1-25:18)

Yitzchak, presented as an offering to God, corresponds to Vayikra, the book of offerings. Yitzchak's life is dictated by the need to be holy; he may not take a Canaanite wife, and he does not leave Israel. This corresponds to Vayikra, also known as *Toras Kohanim* because of its discussion of laws of offerings and the Mishkan.

The third level theme of restricting one's activities in the face of the other means that it represents the concepts of passivity and inaction. Yitzchak's life was fairly passive; he was brought as an

¹ Additional correspondences are seen in that both use blood, both are the only positive commandment punishable by *kares*, and the latter requires the former.

offering, his wife was chosen for him, and he interacted little with others.

Branch Four: The Life of Yaakov (Bereishis 25:19-35:22)

The fourth level is rich and complex in its themes, and there are many parallels between the events of Yaakov's life and those of Bemidbar. We shall just focus on one aspect.

There is a strong theme of prayer in Yaakov's life, beginning with his conception, which was brought about by the initiative of his parents with prayer (unlike the prayer of Avraham for Sodom, which was in response to impending doom). Furthermore, the only *neder*, vow, in all of Bereishis is that made by Yaakov to God as part of a cooperative deal. These correspond to the fourth principle of cooperation via speech. The laws of vows are correspondingly described in Bemidbar and actualized there in the war with the King of Arad, and with the tribes of Gad and Reuven.

Branch Five: The Sons of Yaakov (Bereishis 35:22-50:26)

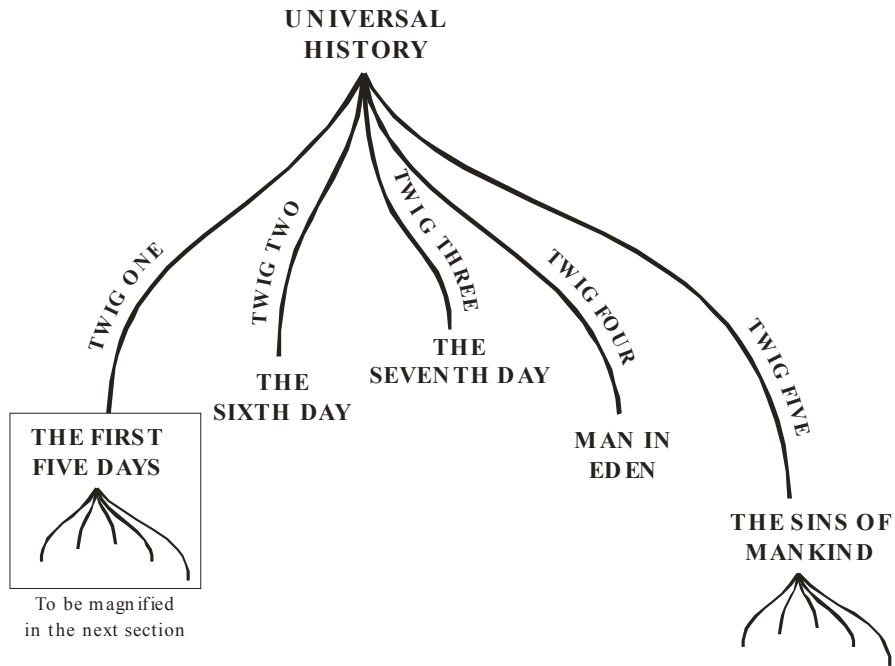
The final part of the Book of Bereishis describes Yosef's work in building up the kingdom of Egypt and the subsequent unification of his family. The concept of kingdom is itself one of maximal unification for a single goal, and is therefore the final stage of the five stages of development.

In terms of man's relationship with God, although stage five is supposed to climax this relationship with God's full revelation in this world, history did not (yet) fulfill that task. Therefore, stage five in history was often a time of God hiding Himself, so to speak, instead. With the sin of Reuven, and the subsequent sins of the tribes, God's Name appears less and less. As with the Book of Devarim, although Moshe speaks at length about the ultimate relationship with God, he is speaking of the ideal; in practice, there is much less mention in that book of God actually speaking Himself.

Correlations between the final part of Bereishis and the final Book of the Torah include the closing sections. Bereishis concludes with the blessings of Yaakov (which we noted in the Book of

Devarim to be a fifth level theme, signifying God's closeness to man), followed by his death, a long period of mourning, and the transmission of leadership to Yosef. Devarim concludes with the blessings of Moshe, followed by his death, a long period of mourning, and the transmission of leadership to Yehoshua (a descendant of Yosef).

C. The Five Twigs On The First Branch Of Bereishis



Twig One: The First Five Days (Bereishis 1:1-23)

The first five days represent the simple concept of creation; there is nothing about a relationship between God and the world beyond that, unlike the sixth day. As such, the first five days represent the first stage of the pattern, that of creation and existence.

Twig Two: The Sixth Day (Bereishis 1:24-31)

The sixth day speak of man’s dominion over world, and as such, represents the second stage; that of one’s sphere of influence extending beyond the self.

The creation of man in the image of God as His representative on earth corresponds to stage two themes at larger scales. For example, it corresponds to Branch Two, with Avraham acting as God’s ambassador to the world; and it corresponds to the Book of Shemos, which describes the selection of Jewish people as God’s representative nation in the world.

Twig Three: The Seventh Day (Bereishis 2:1-3)

The three third-stage themes that we have discussed – passivity, sanctity, and law – are all manifest in the seventh day of the creation week, Shabbos. Passivity is seen in the abstinence from creation that occurred on that day. Sanctity is the function of that day. Law, in terms of the numerous laws of Shabbos observance, is the means of recognizing the sanctity of the day.

Twig Four: Man in Eden (Bereishis 2:4-3:21)

The beginnings of positive cooperation that are the theme of stage four are seen in Adam’s assignment to tend the Garden of Eden. A greater level of closeness with God is seen in that whereas earlier, God only spoke to man, here He engages him in conversation.

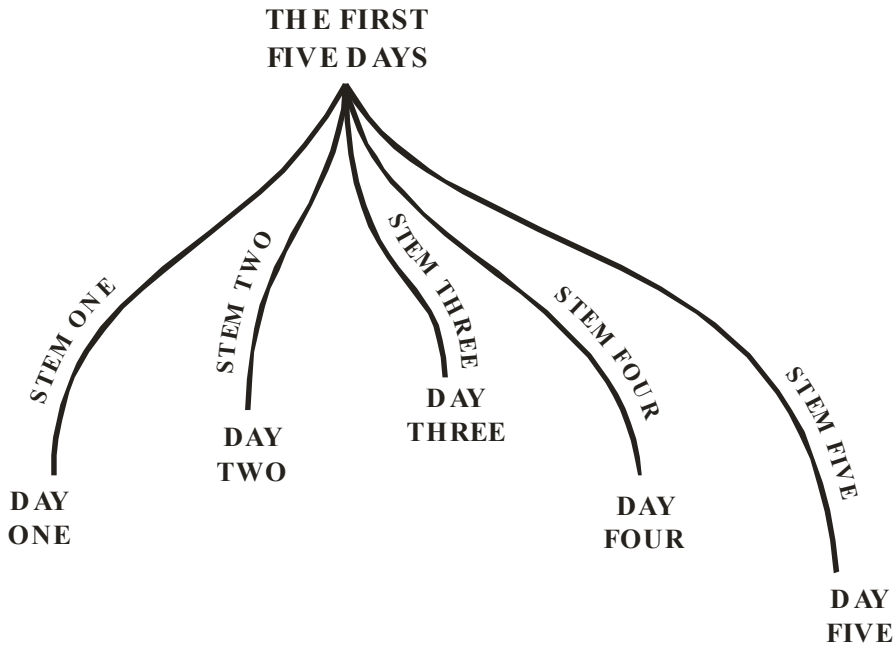
Speech, which we noted to be a level four theme, occurs in many forms in this section; man is created as a “speaking being” (see Targum Onkelos to 2:7); man states the names of the animals; the serpent speaks to Eve; Adam heard God’s “voice” in the garden; and there is a large amount of conversation. There is an idea of cooperation through speech; rain did not fall until man was crated to pray for it (see Rashi to 2:5).

Twig Five: The Sins of Mankind (Bereishis 3:22-11:32)

This section speaks of the sins of mankind that occurred after Adam was banished from Eden. It is a time of God’s concealment,

which we already noted to appear in the fifth section in Bereishis and in the fifth Book of the Torah.

D. The Five Stems On The First Twig



Stem One: The First Day

On the first day, there was the first-stage theme of creation in its purest form, creation *ex nihilo*.

Stem Two: The Second Day

On the second day, there was a separation of the waters on earth and those of the firmament. This corresponds to the second stage in Bereishis of Avraham separating from his home, and the second Book of the Torah in which Israel separates from nations.

Stem Three: The Third Day

On the third day, God drew the boundaries between land and sea. This represents the concept of law, which is the third stage, and corresponds to the third Book of the Torah, which is a book of law.

The creation of plant life corresponds to the theme of agriculture, which is a feature of the third Book of the Torah, and most significantly in the third twig of the third branch of that book.

Stem Four: The Fourth Day

On the fourth day, God placed the luminaries in the Heavens. This relates to the fourth stage theme of verbally attesting to God: “the Heavens speak of the glory of God.” They were created specifically “for signs and for festivals,” which relate to the fourth stage theme of cooperating with God.

Stem Five: The Fifth Day

On the fifth day, God formed the fish and birds, and blessed them to multiply prolifically. The multiplicity of blessing is a fifth stage theme that signifies God’s closeness to man, and corresponds to the blessings in the final section of Bereishis and in the final section of Devarim.

The concept of the animal “kingdom” is that there is a multiplicity of individuals that are united in a central theme or purpose. This is the ultimate stage five theme – that of ultimate unity – and corresponds to the theme of kingdom in the fifth section of Bereishis.

The Fractal Unfolding of Sinai

As an aside, it is fascinating to note that a fractal unfolding pattern is seen not only in the contents of the Torah, but also in the rocks of the mountain on which the Torah was given.

The rocks of the Sinai region display an extraordinary pattern resembling a bush. For hundreds of years, it has been noted that this is significant in that the name Sinai is related to the word *sneh*, bush, as it was from the bush that God first spoke to Moses. This pattern,

apparently caused by a strange mineralogical process, is found throughout each rock, such that if the rock is split in half, new patterns are discovered inside.

The significance for our context is clear. The pattern is a classic fractal pattern, in which the lines branch out, repeating the basic bush-shape at ever-smaller scales. It is a curious hint to the branching pattern of Torah.