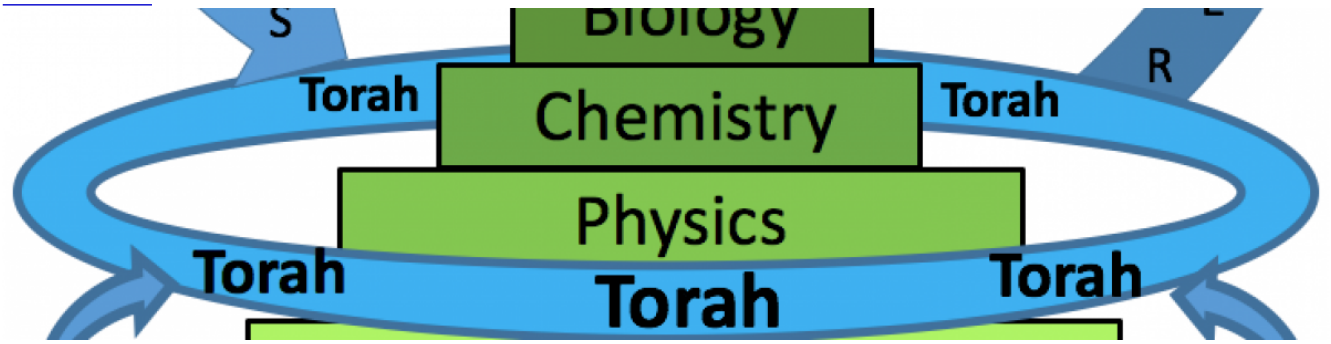
Torah Truths and the Consilience of Human Knowledge

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The Torah is a deep and exciting body of knowledge which embodies everlasting truths. This is not simply a statement of belief but the result of millennia of proof.

Although a revolution in its day when such things as human sacrifice were common, today the tenet of the ten commandments: “Thou shalt not kill.” is a “creed” (a synonym for Tenet) for nearly the whole world. And that is just the tip of the iceberg of truths found in knowledge gleaned from the Torah which today is part of common belief for the society that humanity has evolved.

From a secular perspective, the eminent Harvard biologist E. O. Wilson has attempted in his book “Consilience: The Unity of Knowledge” to unify the base of human knowledge: The sciences and the humanities [E. O. Wilson, *Consilience:*

The Unity of Knowledge, Alfred A. Knopf, Inc. New York 1998]. The book received acclaim from reviewers. However, this seminal work completely leaves out the body of enlightenment from the Torah and its place within the consilience of knowledge.

The object of the present article is to suggest the place that the Torah may occupy within this unification of human knowledge. The deeper question is: Do we get some insight into the hand of Hashem and His ways by trying, with evolving scientific knowledge, to achieve such a consilience of the secular with the spiritual? In essence, this article is a scientist trying to look at the evolving principles in science and see how some of them may interface with the structure laid out in *Consilience: The Unity of Knowledge*.

Scientists generally and physicists specifically are captivated by attempts at unified understandings. An example is the attempts at unifying our understandings of the forces of nature that are still to be fully resolved. So, this attempt at consilience certainly tries to emulate the penchant of scientists for unification.

Torah and Science As Viewed by Past Giants

If we are attempting an understanding of this unity through science, then it is incumbent on us to refer to the thoughts of giants of the past as to the role of science in bridging Torah and other areas of knowledge.

To get a glimpse into the past we divide this section into two parts. The first is the near-present while the second is the near-past.

A View From The Near-Present: An Orthodox Jewish Scientist's View

In our generation, there was a great theoretical physicist who established a new school of science and his name was Professor Cyril Domb. He was also a great

Talmid Hakham.

Michael Fisher, a student of Cyril Domb and a colleague of one of us at Cornell and a great theoretical physicist in his own right, who was seriously considered for a Nobel Prize for his work on the physics and chemisty underlying ice formation, has written a lovely perspective on Professor Domb [Michael Fisher, "Cyril Domb: A Personal View and Appreciation J Stat Phys (2011) 145:510–517 DOI 10.1007/s10955-011-0381-x]. This paper highlights his great scientific accomplishments but also his deeply held Orthodox Jewish beliefs.

However, what the paper by Fisher did not emphasize was the great interest that Professor Domb had in bridging science and Jewish thought. His book *Challenge* takes a special place on the book shelf of any Orthodox Jewish scientist. [see by Aryeh Carmell and Cyril Domb, *Challenge: Torah Views on Science and Its Problems*, Feldheim Pub; 2nd edition (January 1988)]. With such great individuals as Cyril Domb who have gone before, the current authors are humbled by the request to put down some thoughts that may add a few planks to this bridge which has been established and contributed to by so many people over the centuries.

Professor Domb who received many great honors in his lifetime, including being elected a Fellow of the Royal Society, still lives in the hearts of those he left behind to paraphrase the 18th century Scottish poet Thomas Campbell. Thus, it is fitting to start out with a significant message that he left from his special scientific and Jewish perspective. As Professor Domb used to say, the difference between Torah and science is that Torah is constant and never changes but science is constantly changing.

So, with this missive from a revered scientist we appreciate that any perspective given in this article is bounded by the evolution that will surely take place in science from the moment that this article appears.

A View from The Past: The View of Our Great Sages

The Hebrew word *Hitbonenut* is a central term in Hasidut. The basic meaning of the term is to look at the creation of God in order to love, awe and connect to God.

Surprisingly, the origin of *Hitbonenut* comes from the Rambam, a giant who may be considered by many people the opposite of Hasidut. In the Halakhot of the foundations of the Torah (Chapter 2, Halakha 2) he writes that the way to love and awe God is to look at the wonderful creations in the world and see the wisdom of God with no boundaries. This immediately leads one to love and praise God and be filled with a desire to know Him.

From the perspective of a scientist, one learns the internal structure and interactions of many aspects of the world, be it sub-nuclear particles or leaves. One of us (AL) always thinks of this when he sees a leaf. He compares his reaction to a leaf before and after he understood the internal structures which are sculpted in such intricate detail to hold the chemicals critical in the actions of a leaf, namely photosynthesis. But even this is not all, since, with scientific knowledge one begins to get a glimpse at the deep physics, biophysics and chemistry that are interconnected in an ultra-precise way in a leaf. It is this intricacy that underlies all of photosynthesis from the light that is captured, to the funneling of the light energy to create oxygen so crucial to humanity and the intricate detail of how carbon dioxide effused by man is taken in and food and fodder is created. Now couple this to the diverse beauty of a leaf and its synergistic place in sustaining the world and humanity and no scientist who knows about this cannot say to himself how wondrous is this world.

Within such a feeling one understands Rabbi Shneior Zalman from Ladi (The Alte' Rebbe) in his book *Tanya* in which he writes that a man looking deeply at the world realizes how God is everywhere and it brings him to search and love and awe God.

The Unity of Knowledge: Can We Fit The Torah In and How?

Consciousness is multidimensional. A spiritual giant has one view of a multidimensional view and then there are those who have both a spiritual and scientific view. Professor Cyril Domb was certainly such a person. Another

extraordinary individual, whom we had the fortune to know personally, was Rabbi Solomon Sassoon [see his book: *Reality Revisited: A New Look at Computers and Minds, Physics and Evolution,* Feldheim 1991. p. 251]. In essence, when one appreciates the science, an additional component of consciousness is achieved that brings an even deeper understanding of the beauty of the world.

Wilson in his book puts great emphasis on the centrality of Biology and Genetics in what has led to society and the humanities that have evolved from the consciousness of man and the awareness he has of his surroundings.

This consciousness and this awareness in all corners of our world has stimulated humanity to seek spirituality. This is in all parts of the world. There is no society that did not search for the spiritual. In general, in these societies there are special individuals who have led their people/disciples to search beyond the material. These individuals do touch some part of the spiritual but arrive at some parts of the truth without the generality of the Torah as perceived by the forefathers of Judaism.

It is certainly clear, however, that there is something in the nature of humans that makes them search for the spiritual.

From a scientific point of view, a possible insight to comprehend this appearance in humanity of individuals searching for the truths of spirituality needed for the harmonious structure of the world comes from an evolving understanding of the biochemical basis of the genetic alterations in humans. And, of course genetics is central in Wilson's structure.

It is now clear that very small genetic defects can cause very large changes. This has been seen regularly since the first understandings of molecular genetics when Linus Pauling showed in the 1950s that sickle cell anemia, which causes enormous physiological problems, resulted from a single change in one amino acid in the protein hemoglobin. From a qualitative perspective this is approximately an ~0.02% change in one protein that results in this disease.

Therefore, it should not be surprising that more recently there has been a growing body of evidence that very small changes in proteins can cause large changes in many different aspects of our life including the ability to learn [Marla B. Sokolowski, “Drosophila: Genetics meets behavior,” p879 | doi:10.1038/35098592 (2001)].

One of the first systems that highlighted this possibility was the foraging behavior of fruit flies. In this system, even single genetic mutations, resulting in a reduction in the activity of a single protein by only a relatively small percentage, could change the foraging behavior for food after satiation from fruit flies that do forage to ones that never forage. This is also supported by experiments on mutant rats on a critical protein in the neurons of the brain called the GABA receptor that effect learning and this is only the start of a growing body of such evidence.

Thus, a good hypothesis is that relatively small genetic changes could either cause beneficial or less than beneficial changes in human behavior. So, genetic diversity has the potential to result in behavioral diversity that, with a finite probability and within a defined time span, can produce an individual who searches for truths that alter the framework in which man lives.

It can even be said that biological systems have a built-in, relatively high frequency of genetic change that also results in behavioral diversity. One interpretation of these new perceptions is that humans may have a built-in tendency for extremism. Especially in our world today we see such alarming extreme behavior from the negative perspective. Obviously, however, extremes can also be positive. A telling recent example was the genius of Einstein.

In actuality, out of this diversity a rainbow of individuals can result some of whom are extraordinary and take human kind on new and enlightened paths.

Most of us are in the middle and for us what Thomas Edison used to say: “that genius is one percent inspiration and 99% perspiration” is telling and an

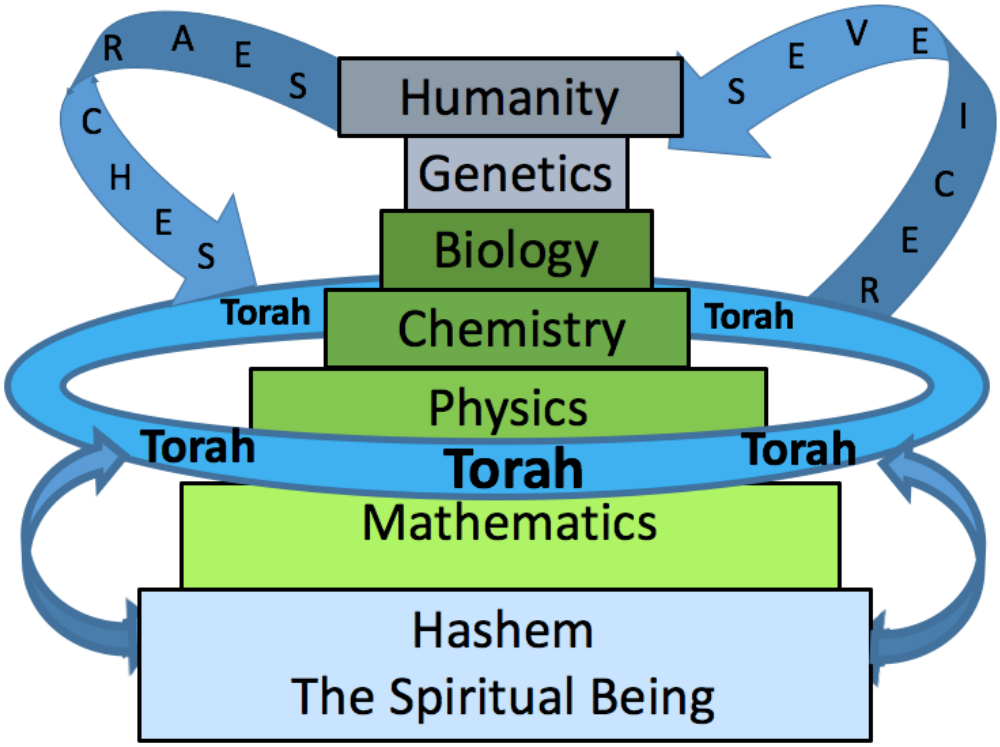
important reminder. Although Edison coined this phrase, it was the grandmother of one of us (AL), Hannah Meyer who ingrained this in all of our family and it has helped AL tremendously.

The Torah has many examples of these exceptional individuals from Noah to Abraham, to Isaac and Jacob and to Joseph and Moshe. These people had a genetic make-up to break out of the crowd and give the world new spiritual directions. This allowed them to touch the body of Truth that is the Torah and allowed the Jewish people to be a shining light to the peoples of the world. Not only have these everlasting Truths of the Torah lasted through the millennia, but they have been adopted with a universality that may give some vision of what Sephardim say in the *Aleinu LeShabeiakh*, that there will be a day that our concept of one God will be accepted universally.

The Model

With the evolving understandings described above, how can the Torah be integrated into Wilson’s structure of the consilience of knowledge

A suggested diagrammatic view of such an integrated structure in the higher structure of knowledge as noted by Wilson is shown below.



The green is Wilson's realization that the structure of knowledge is based on mathematics, physics, chemistry and biology. Genetics is the outcome of biology. Genetics is the outcome of alterations in DNA. Genetics is a very dynamic process with alterations continually occurring. These alterations and genetics lead to humans with extreme ability to touch the Torah and its basic truths.

Such individuals with their unique insight arise out of a structure that we know has existed from the start of the universe since even in distant stars we see the same physics and mathematics applying. Obviously, one can just reject the need for a spiritual being. One can instead rely on some happenstance that is completely not understandable to anyone in science and, for that matter, for which there is no example. Or, one can ask the question what is in humanity that allows for all societies to search for the spiritual.

This article obviously works on scientific observation and the observation is that every society searches for a spiritual being and have even touched some of the Truths that are in the Torah.

Using the structure of Wilson and referring back to the diagram of the model one can suggest a connection between the universal human search for spirituality and the spiritual. The dark grey rectangles are a result of Wilson's structure and from these emanate the search for Truth indicated by light blue arrows. Such a search led our extraordinary spiritual leaders to realize the Truths of the Torah. These are now part of the world and have been proved over millennia in numerous areas be it Berit Milah or the Shabbath day of rest or the anathema of killing etc.

Thus, the model can be summarized as a plan laid in place from the initiation of the Universe. This plan led to man's consciousness and has allowed man to find His presence. One could speculate that in generating such a structure He realized that He required the participation of man to implement the Torah and its basic Truths in the world.

A Test of the Model

In the Torah Itself

Genetic Diversity

In Bereshith, we are introduced to the twin sons of Isaac and Rebekah, Jacob and Esau. Here is a classic case of two genetically diverse individuals--one who had the potential to touch the spiritual and the other firmly a man of the world. We are told about their diversity even before they are born. In spite of Esau's great love for his spiritual father, Isaac, he was clearly not concerned about any future role when he saw his birthright as worthless. Jacob, on the other hand was most concerned with his birthright and his future role. Nonetheless, it was his mother who, seeing his potential, finally had to urge him to move to the next step.

Through this description in the Torah of the involvement of his mother, we see an addition to the above model, namely, free choice. His mother saw his potential but he at first demurred to follow the ruse his mother suggested. But, he needed

to take this step in order to achieve that level of preparation of himself for the spiritual encounter. And, we see free choice in each and every one of the individuals who touch the Truths of the Torah. This also applies tothe ultimate individual in Israel, Moshe, who debates his qualities for this spiritual role.

A Spiritual Individual in a People that is Not Part of the Jewish People

But, if the model has some validity does the Torah tell us about an individual who is not a part of the Jewish people who can touch the spiritual. The best example of this is Balaam. Balaam cannot touch all the Truths and maybe there are other problems with this individual; but certainly he is in touch with the Spiritual, the same Spiritual being connected with Judaism and he saw the Truths expressed in the Jewish people. Thus, as one example, Balaam saw in the Jewish people that they embodied from the Torah family privacy. Therefore, while viewing the Jewish camp he expresses the now famous expression,“How good are your tents, O Jacob, your dwelling places Israel” [Bemidbar 24:5]. He views in the Jewish camp the beauty of the Jewish people. He sees their appreciation of privacy expressed in personal relations in Judaism by the positioning of the opening of neighboring tents in a way that entrances did not look one into the other.

Moreover, our commentators even intimate that Balaam had great spiritual potential. Obviously, however, due to free choice Balaam did not reach his full potential. Namely, the Torah was there for everyone and Balaam touched it but he and others like him refused to be fully constrained by the Truths they may have seen in the Torah.

From the Talmud

Concern for the Humanity That Touched the Torah

Thus, humanity that evolved from genetics was crucial, and one critical aspect of the great Truths in the Torah is the great concern for humanity.

This is highlighted in the Torah by placing Parashat Mishpatim which emphasizes how man behaves to his fellow man directly after the ten commandments; but this is also a central theme in the Oral Torah.

This epicenter of the Torah, as expressed in both the written Torah and Oral Torah, clearly aimed at developing a harmonious society. To highlight this even further, an antithesis in the Torah is the less than favorable view of asceticism.

In the Torah we read in Vayikra 19:18, “I am the Lord and you shall love your neighbor as yourself etc”. With such a directive from the Torah Hillel the Elder beautifully emphasizes this criticality in the Torah when he was asked to teach a convert on one foot the whole Torah. He answered “What is hateful to you do not do to your acquaintance, that is the all of the Torah and the rest is explanation” [Babylonian Talmud, Shabbath 31A]. And, Rabbi Akiva emphasizes this by saying, “This is a great rule in the Torah”.

The Need for Joint Efforts of Man and God As Seen in the Blue Arrows of the Model

The Talmud in Sandhedrin highlights, in the name of Hashem, the importance of man worrying about his fellow man. The 11th chapter of the tractate Sanhedrin opens with a Mishna which considers which sinners will not merit the world to come. One such perceived sinner is Mica (not the prophet Mica) [Sanhedrin 103b]. In a source that is brought as part of this discussion of Mica, the angels wanted to place Mica among the evil doers since Mica set up a place of worship with an idol in close proximity to Shilo, the place of the Tabernacle before the building of the Temple. People used to come to Mica and even engage in idol worship. As part of his hospitality Mica used to feed these travelers on the way to Shilo. Hashem placed such emphasis on this charity that the Talmud says that Hashem prevented the Angel’s decision. He saw the charity of Mica as crucial to encourage his people to go to the Mishkan [A. Ziederman and S. Ziederman, Parashat Ki Tavo, Faculty of Jewish Knowledge Newsletter Number 1188 (2016), Bar-Ilan University]. In essence, this was a joint effort of man and God to

encourage man's worship.

The Torah Is Given for This World

Such a theme where mankind brought the Torah into this world and is its principle instrument of implementation in our society is further emphasized by a well-known event in the Oral law known as the oven of Aknai [Baba Mezi'a 59a]. The event relates to Eliezer ben Hurcanus who was one of the most prominent Tanaim in the 1st and 2nd century CE.

The issue of the oven of Aknai concerns a debate over the halakhic status of a new type of oven. This oven was brought before the sages and the question was whether the oven was susceptible to ritual impurity.

Rabbi Eliezer ben Hurcanus argues that the oven is ritually pure while the other rabbis, including the Nasi, who was his brother-in-law, argued that the oven was impure. Rabbi Eliezer tried to convince his colleagues of the validity of his arguments and when he failed, he relied on supernatural wonders as extraterrestrial proof of his arguments. Finally, a heavenly voice substantiated Rabbi Eliezer. But then Rabbi Joshua quoted Devarim 30:12 that the Torah is not in heaven. In essence, the Torah is for mankind as an available source and guide for human implementation. If at every instant man had to ask heaven if this or that is the law, then it would not be available to mankind as an internal instant guide that could lead mankind. To paraphrase what is said in Devarim 30:11-14, the Torah is not far from us but rather, the Torah is very close to us. It is in our mouth and our heart since we touched it and, we the Jewish people, realized what we had so that we could fulfill it.

Not Forgetting The Torah

So this brings us to a final issue. The Torah Truths were introduced millennia ago but remain dynamic, alive, not forgotten and still effectively implemented by Jewish society in as close an emulation to its original form as possible. What is the essence of this dynamism? The Torah itself guides us to how to keep it alive. In essence, the learning and transmitting are the central components that keep the Torah alive. Learning is a truth that emanates from the Torah and has kept

the Jewish people not only spiritually alive but as a people who excel in all disciplines.

Conclusion

In conclusion, this integration of the Torah into how knowledge has been organized in the secular world relies on the fact that the spiritual has been searched for in all societies; everlasting truths have been touched by extraordinary individuals. In reaching out and touching the Torah these extraordinary Jewish forefathers tamed the world from the drastic extremes of human behavior that result from genetics and set the way to reach the ideal of a central path, “the golden way”, as expounded by the Rambam, the ultimate philosopher who merged Torah and science as early as the 13th century.