

## METHODOLOGIES COMMON TO SCIENCE AND *HALAKHAH*

This article outlines areas of overlap in the methodologies used by both *Halakhah* and science as developed by Rabbi Joseph B. Soloveitchik and Professor Richard Feynman, respectively. In their writings, they both contrast the subjective worldview of the artist or the person of Faith who asks "why" with the quantitative, objective approach of the scientist or the *halakhic* individual who asks "how" or "what". The common methodologies involve the issues of unique languages, the role of idealization and approximation, and the ability to use a small number of unifying principles to deal with very complex phenomena. Finally, and not surprisingly, considering their own contributions to their fields, they both have emphasized the role of creativity in furthering science and *Halakhah*.

### I. INTRODUCTION

Science and the *Torah* confront each other in a variety of forums. Sometimes, the focus of this confrontation lies in the philosophical plane of issues, such as the existence of God, evolution of the species, creation of the universe, and the nature of miracles. These questions lead to responses which range from denial (of either science or the *Torah*), to apologetics or to conflicts being relegated to the realm of a religious trial — *nissayon*, as well as to intellectually honest, but untestable, efforts to grapple with these weighty subjects. At the other extreme, the emphasis might be on the confrontation in the more practical arena of the problems posed and solutions offered by technology to areas such as medical ethics, Sabbath observance, and automation. In this paper, I will deal with a third area of common interest to science and *Halakhah* by outlining some methodologies and approaches that are embraced by both. My choice is motivated by the feeling that meaningful dialogue between the scientific (or general intellectual) community and the *halakhic* community must be preceded by a clear understanding of the scope and workings of these two very different endeavors. Without this understanding, the philosophical dialogue concerning the weighty issues cannot be taken seriously, and the impetus for the *halakhist* to harness technological innovation to *halakhic* problems is viewed as an attempt to fool the Creator.

I shall base my discussion on the writings and influence of an eminent *halakhist* and thinker, Rabbi Joseph B. Soloveitchik (known by his pupils as the *Rav*), and of an outstanding researcher and lecturer of physics, Prof.

Richard Feynman. While their personal lives and intellectual communities were vastly different, they have in common the unusual combination<sup>1</sup> of being experts in all the technical aspects of their arts, as well as being attuned to the question of the place that their discipline holds in both the intellectual and world order. In addition, they were each expert communicators who excelled in focusing on the central issues and explaining them in simple terms. This undoubtedly came from a deep, unified, and fundamental understanding. Finally, their writings convey a sense of drama, awe and joy at the way in which their particular mode of thinking reveals to us part of the great cosmic mystery.

The approaches that I discuss include those which focus on the respective purposes of science and *Halakhah* — both Feynman and the *Rav* write with great conviction about how they deal with the question of “how” or “what” versus that of “why.” In addition, both deal with the subjective worldview of the artist — as opposed to the scientist (in the case of Feynman) or of the person of Faith — as opposed to the *halakhic* individual (in the case of the *Rav*). The common methodologies involve the issues of unique languages, the role of idealization and approximation, and the ability to use a small number of unifying principles to deal with very complex phenomena. Finally, and not surprisingly, considering their own contributions to their fields, both Feynman and the *Rav* have emphasized the role of creativity in furthering science and *Halakhah* respectively.

## II. THE FOCUS OF SCIENTIFIC AND HALAKHIC INQUIRY

To begin with, Feynman and the *Rav* both believe that there is a difference between the questions asked by science and *Halakhah* compared with the ones examined by other fields of endeavor. These differences are rooted in the fact that the scientist and the *halakhist* both ask how things work and hardly concern themselves with why things work as they do, or even how the laws of physics or those of *Halakhah* evolved. Both the scientist and the *halakhic* individual share the common goal of providing an objective model<sup>2</sup> to subjective reality. This differentiates the perspective of the scientist from that of the artist or writer who tries to capture the subjective character of nature. Similarly, it separates the *halakhic* thinker (*Ish Hahalakhah*<sup>3</sup> or the *halakhic* individual) who attempts to reconstruct the subjective religious experience from the objective *Halakhah*, from the person of faith who seeks the Creator in a more direct, but perhaps unattainable manner. The focus on quantitative, objective models does not mean that the scientist lacks the aesthetic appreciation of the painter or the poet, or that the *halakhic* individual is incapable of a deep religious experience. The scientist begins with the physical

law, and this knowledge leads to an appreciation of the beauty of nature; the *halakhist* reaches God through the understanding of His laws.

Both Feynman and the *Rav* emphasized that the objective approach eventually enables one to gain deeper insight into the subjective reality. In discussing the different views of the artist and the scientist, Feynman states:

Even the artists appreciate sunsets, and the ocean waves, and the march of the stars across the heavens. As we look into these things we get an aesthetic pleasure from them directly on observation. There is also a rhythm and a pattern between the phenomena of nature which is not apparent to the eye, but only to the eye of analysis; and it is these rhythms and patterns which we call Physical Laws.<sup>4</sup>

Poets say that science takes away from the beauty of the stars — mere globs of gas atoms. Nothing is “mere.” I too can see the stars on a desert night, and feel them. But do I see less or more? The vastness of the heavens stretches my imagination.... What is the pattern or the meaning.... It does not do harm to the mystery to know a little about it. For far more marvelous is the truth than any artists of the past imagined!<sup>5</sup>

The *Rav* makes a similar point in discussing the religious experience of the *halakhic* individual — the subjective beauty and depth is all the more attractive when one reaches it through objective understanding. Interestingly, he also mentions that this is the case for the scientist.

The *halakhic* individual is capable of a glorious religious experience... which comes after he has understood the ideal, model world of the *Halakhah* and its correspondence to the real world. Because this experience occurs after a critical and penetrating investigation, it is unusually intense. This corresponds to a physicist who is occupied with mathematical equations, with the laws of mechanics, electricity and magnetism... who performs difficult and complex calculations... which model somehow the nature of reality. Does the physicist not revel in the cognitive act ...?<sup>6</sup>

The *Rav* emphasized the connection between the objective nature of *halakhic* analysis and the subjective religious experience. In his view, the *halakhic* approach is differentiated from religious liberalism in that the *Halakhah* begins with the objective while the latter begins with the subjective — something that in the *Rav's* opinion is a potential source of error and misunderstanding.

Objectification reaches its highest expression in the *Halakhah*. *Halakhah* is the act of seizing the subjective flow and converting it into enduring and

tangible magnitudes. It is the crystallization of the fleeting, individual experience into fixed principles and universal norms.<sup>7</sup>

Rabbinic legalism, so derided by theologians, is nothing but an exact method of objectification....It is interesting to note that the *Halakhah* frequently operates with quantitative standards. It attempts not only to objectify religiosity, but also to quantify it.

The basic error of religious liberalism is to be discerned less in its ideology than in its methodological approach. Liberalism has traveled in the wrong direction — from subjectivity to objectivity....Subjective religiosity, the moderns say, is subordinated to the omnipotent authority of time and change...such a school will always begin with the subjective domain. It will perhaps claim to have analyzed the deepest strata of the religious consciousness and have examined the God-thirsty soul with all its conflicting emotions and paradoxical sentiments....The fallacy of this movement lies in its utter lack of methodology. Where is the assurance that these philosophers, while exploring modern religious subjectivism, have not erred and strayed?<sup>8</sup>

The futility of beginning with the subjective “reason” for the *Halakhah*, rather than the analysis of “how” the *Halakhah* works, plagues not only religious liberalism, according to the *Rav*, but is also responsible for the lack of widespread acceptance of the “Guide for the Perplexed” of Maimonides, in contrast to the universal acknowledgment of his Code (the *Mishneh Torah*) by both theoretical and applied (*psak*-oriented — e.g., the Code of Jewish Law) students of the *Halakhah*.<sup>9</sup>

Twenty-five chapters of the Guide are devoted exclusively to the solution of this problem. However, Maimonides’ attempt at rationalization...brought forth a historical...controversy that embroiled all Jewish scholars of that epoch...one must admit that the...master whose thought shaped Jewish ideology for centuries to come did not succeed in making his interpretation of the commandments prevalent in our world perspective...such explanations neither edify nor inspire the religious consciousness.... Instead of describing, Maimonides explained; instead of reconstructing, he constructed.

In contradistinction to the causal method of the philosophical Guide that led to a religious *techné*, the *halakhic* Code (the *Mishneh Torah*) apprehends the religious act in an entirely different light. The Code does not pursue the objective causation of the commandment, but attempts to reconstruct its subjective correlate. The “what” question was his guide in the Code.<sup>10</sup>

In addition, the *Rav* felt that subjectivism in religion (even by religiously devout individuals) is potentially dangerous for the continuity of the religion; the focus subjectivity can lead to platitudes or sentimentalism in trying to "explain" the Law. Platitudes are not only devoid of real meaning; they also hinder the ability to develop society in accordance with God's will. Finally, the objective nature of the *Halakhah* allows the religion to be open to all those who choose to be governed by its norms and not merely those who are capable of an introspective religious experience.<sup>11</sup>

First,...it is almost impossible for a representative of a theistic, apocalyptic religion to satisfy his needs with mere inward religiosity.... The norm, if such exists in the philosopher's religion, plays a secondary part. With the demotion of the norm and the elimination of the practical outlook, subjectivism becomes quite acceptable. Religion is then attenuated into sentimentalism and God is arrested within inwardness. In contrast with the philosopher, the essential problem of the *homo religiosus* (in this context, the believer in revealed religion) is a normative one. It is directed at explicit knowledge and concrete action... "How should I act in daily life? How should I live according to the will of God?..."

Second,...all attempts to divorce subjectivity from objective standards and postulates have been fraught with menace to ethical and cultural advancement.... When intercourse with God is divorced from its social and communal aspects and concrete normative action, religion may develop into a barbaric, deleterious force.

Third, the character of religion is exoteric. The religious act must be accessible to every member of the human race.... Aristocracy in the religious realms is identical with the decadence of religion.... The introduction of spiritualistic interpretations into religion renders the religious act esoteric. Religious introspection is not universal but depends largely upon the uniqueness of individual mentalities.... The exoteric objective series is far more universal than recondite subjectivity.

The *Rav* showed great awareness of the role of the quantitative physical sciences in constructing mathematical models of reality and the analogous development in *Halakhah* by his grandfather, Rav Haim Brisker.<sup>12</sup>

*Rav Haim* who was gifted with *halakhic* intuition...introduced the element of conceptualization in *Halakhah*. He built a world of ideal (concepts)...similar in a strange way to the approach of the mathematical science to the real world.... Classical and also modern physics...accepted

the irrational nature of the universe as it appears.... However, people can construct quantitative models which parallel the behavior of the world. These idealized correlations... have become the object of scientific inquiry. Palpable experiences such as color, sound, heat were turned into idealized quantities.... *Rav Haim* introduced a similar approach to *Halakhah*...”  
 ...we are confronted with a duality in the religious realm similar to that existing in science.... Reconstruction... must be applied in the religious domain. There is no direct approach to pure religious subjectivity. Objective forms must be postulated as a point of departure, and... one may gradually reconstruct underlying subjective aspects.

Feynman also emphasized that the study of science in general, and physics in particular, focuses on how the universe operates, rather than why it does so. Often, one must be content with a phenomenological understanding of the laws, rather than some underlying mechanism behind them.<sup>13</sup>

What does the planet do? Does it look at the sun, see how far away it is, and decide to calculate on its internal adding machine the inverse of the square of the distance, which tells it how much to move? This is certainly no explanation of the machinery of gravitation! You might want to look further, and various people have tried to look further. Newton was originally asked about his theory “But it doesn’t mean anything — it doesn’t tell us anything.” He said, “It tells you how it moves. That should be enough. I have told you how it moves, not why.” But people often are unsatisfied without a mechanism.

### III. METHODOLOGIES

In the previous section we have seen how both the *Rav* and Feynman respectively limited the scope of *halakhic* inquiry and physics to focus on questions of “how” or “what” rather than “why.” Here we shall focus on particular approaches that are common to both disciplines. Both science and *Halakhah* concern themselves with an objective, quantitative model for the subjective, qualitative world. The analysis of these quantitative models requires an appropriate language — mathematics in the case of science, and *Talmudic* categorization in the case of *Halakhah*. One cannot appreciate the depth of, nor can one apply, the quantitative, physical sciences without mathematics. Similarly, one cannot formulate *Halakhah* using historical, philosophical, or literary concepts or modalities. Certainly one can talk about physics using no mathematics but one cannot *do* physics using words alone. In a similar manner, one can try to probe the historical motivation for the development of the

*Halakhah* by a particular individual, but that historical process has little to do with the abstract formulation of the *Halakhah*.<sup>14</sup>

This does not mean to say that the *Halakhah* is outside the stream of (real) events....However, this joining with history does not influence *halakhic* thinking and method, just as history does not change the laws inherent to mathematical thinking....Certainly, events...force the *halakhist* to grapple with spiritual-ideal concepts which carry with them an answer to those confused by the events....However, this joining with history does not influence *halakhic* thinking and method, just as history does not change the laws inherent to mathematical thinking....

However, even these seemingly quantitative descriptions are only approximate. In physics, this approximation may be chosen to be relevant to the length, time, or energy scale of interest; in describing the flow of a classical fluid using the equations of hydrodynamics, it is not necessary to describe or even consider the quantum nature of the electrons, protons, and neutrons that compose the liquid. Choosing the correct approximation (which often means knowing how to focus on the correct length, energy, and time scales) is an important part of scientific problem solving. As Feynman says:<sup>15</sup>

Each piece, or part, of the whole of nature is always merely an approximation to the complete truth, or the complete truth so far as we know it. In fact, everything we know is only some kind of approximation, because we know that we do not know all the laws as yet. Therefore, things must be learned only to be unlearned again or, more likely, to be corrected.

In the *halakhic* realm, the model is not correlated with the physical world, *per se*, but with the subjective reality of existence. Here too, one recognizes that even the *Halakhah* is only an approximate attempt to objectify and quantify the subjective religious experience.<sup>16</sup>

In order to overcome the mystery of existence, he (the person of knowledge, *Ish Hada'at*) builds an ideal, ordered world...which he compares with the real world....The transformation from an *a priori* to an applied individual takes place by exploring the correlations between the real and ideal worlds....He is not interested in the essence of sensory experiences but rather in their relationship to his great creation (the model world system)....The approach is that of the mathematical natural sciences, the crowning glory of culture....This correlation is only approximate...

Another area where there is an interesting parallel between science and *Halakhah* is the relationship between the theoretical and experimental approaches. The physical sciences are distinct from mathematics in that the significance of their theories lies in its relevance to experiment. Theory is motivated by and stimulates new experiments. Feynman speaks of a division of labor between the theorist and the experimentalist:<sup>17</sup>

The principle of science, the definition, almost, is the following: The test of all knowledge is experiment. Experiment is the sole judge of scientific "truth". But what is the source of knowledge? Where do the laws that are to be tested come from? Experiment, itself, helps to produce these laws, in the sense that it gives us hints. But also needed is imagination to create from these hints the great generalizations — to guess at the wonderful, simple, but very strange patterns beneath them all, and then to experiment to check again whether we have made the right guess. This imagining process is so difficult that there is a division of labor in physics; there are theoretical physicists who imagine, deduce, and guess at new laws, but do not do experiments; and then there are experimental physicists who experiment, imagine, deduce, and guess.

The correlation of theory and experiment in *halakhic* analysis might be understood by considering this analysis as theory and the Biblical verses or undisputed laws of Mosaic origin (e.g., *Halakhah L'Moshe Mi'Sinai*) as the empirical, given experimental data. *Halakhic* classification schemes must be consistent with these data that include known, undisputed laws as well as the verses from which the general principles are derived. This consistency requirement provides the experimental test of a *halakhic* theory. Along with the concept of experiment and theory in *Halakhah*, one can also define the analogy of "applied science" or engineering; the pure *halakhic* classifications (e.g., whether a certain law focuses on the person involved — *gavrah* — or the object involved — *cheftza*) would correspond to pure science while the application of *Halakhah* to specific cases of practical interest (*psak*, *Halakhah Lema'aseh*) would correspond to applied science or engineering. The *Rav* felt strongly that:<sup>18</sup> "...a cardinal principle of *halakhic* thinking is (an emphasis) not on practical application of the *Halakhah* (*hora'ah*) but rather the establishment of *halakhic* theory...."

Furthermore, he emphasizes that in the *Yeshiva* of Volozhin it was customary to study all the tractates of the *Talmud* in order, whether or not they contained laws applicable in present times. In the Code of Maimonides we find all the laws of the *Torah*, including those which are not applicable today. This is similar to the situation of mathematical models, such as those which focus on non-

Euclidean geometry that were studied as ends in themselves until physicists determined their applicability to the physical world.

A major distinguishing feature of the approach of the physical sciences is the attempt to simplify the wide variety of natural phenomena by focusing on a few, fundamental physical laws that can be used to explain and predict. This contrasts with the more empirical method used in some of the other sciences (both natural and social), which emphasize classification without amalgamation into unifying principles. The difference between the two approaches lies in whether one focuses on the laws (with the phenomena providing motivation and experimental tests of these laws) or on the multitude of phenomena themselves. As Feynman explains:<sup>19</sup>

Curiosity demands that we ask questions, that we try to put things together and try to understand this multitude of aspects as perhaps resulting from the action of a relatively small number of elemental things and forces acting in an infinite variety of combinations.

What is common to different kinds of sound? How many different colors are there?...In this way we try gradually to analyze all things, to put together things which at first sight look different, with the hope that we may be able to reduce the number of different things and thereby understand them better.

At first the phenomena of nature were roughly divided into classes, like heat, electricity, mechanics, magnetism, properties of substances, chemical phenomena, light or optics...etc. However, the aim is to see complete nature as different aspects of one set of phenomena. That is the problem in basic theoretical physics today — to find the laws behind experiment; to amalgamate these classes.

Some historic examples of amalgamation are the following: First, take heat and mechanics. When atoms are in motion, the more motion, the more heat the system contains, and so heat and all temperature effects can be represented by the laws of mechanics. Another tremendous amalgamation was the discovery of the relation between electricity, magnetism and light which were found to be different aspects of the same thing, which we call today the electromagnetic field. Another amalgamation is the unification of chemical phenomena, the various properties of various substances, and the behavior of atomic particles, which is in the quantum mechanics of chemistry.

In a similar manner, the *Rav* emphasized that although one begins a *halakhic* inquiry with classification, the ultimate purpose is to discover the unifying principles which can amalgamate and unify these classifications.<sup>20</sup> “The

*Halakhah* is not a confused mass of laws, but rather an approach which unifies....” In his own lectures, the *Rav* always emphasized the conceptual points of the Talmudic analysis; the text itself was a springboard from which one derived the principles. The underlying verses, exegesis, and even some of the Talmudic give and take were secondary to these principles, except in the important cases where these texts themselves point the way to conceptual understanding. In a discussion of the unique contribution of his grandfather, Rav Haim Brisker, to the development of *halakhic* analysis, the *Rav* gives several concrete examples<sup>21</sup> of this focus on principles versus the focus on the phenomena.

The first example concerns the laws of *halakhic* legal documents or *shtarot*. Before R. Haim these laws were based on technical aspects of writing, signing and psychological explanations of intent. R. Haim strove towards a complete conceptualization of these issues and removed the technical aspects in order to reveal the essence of the Laws of *Shtarot*. The *shtar* left its physical aspect and became an idealized object: a novel form of testimony that does not require a recounting of the events in court and all that it implies. Together with this idea, R. Haim invented new concepts relevant to both oral and written testimony. Now, many analogies could be drawn between these two types of testimony: the laws of disqualified witnesses, investigation of the witnesses (or *shtar*), messengers involved in the testimony, witnesses who verify an occurrence as opposed to those who initiate an act. The origin of all these ideas is based on a terse statement by *Resh Lakish* that says that the signature of the witnesses on a *shtar* is equivalent to the interrogation of those witnesses in court.

Another example given by the *Rav* concerns the laws of prayer. Prayer in *Halakhah* used to be relegated to laws for laymen. These *Halakhot* were typically found in the abbreviated Codes of Law (for laymen) or in the synagogue calendar. Suddenly, with the advent of R. Haim, prayer stopped being a technical topic or one that was *Hassidic* or pietistic, and became an idealized concept. The various styles of the prayers and blessings reflected their *halakhic* purpose. Other new categories were created which were never thought of previously: the act of prayer as opposed to the *kiyum* (fulfillment) of the prayer, *kiyum* in action and in the heart, intent as the essence of prayer (as opposed to questions of intent in performing other commandments).

Finally, a very picturesque description of how the laws of forbidden foods and mixtures (*issur v'heter*) changed their nature once the focus was placed on the concepts instead of the actual phenomena is given by the *Rav*:<sup>22</sup>

Suddenly, the spoons and pots, the onions and scallions...the boiling water and oil that fell into the wine...vanished (from the *Halakhot*)....The

laws of the forbidden foods and combinations were channeled away from housekeeping and placed into an ideal, *halakhic* sphere....

This emphasis on the underlying concepts and amalgamation by both Feynman and the *Rav* does not mean that either of them was unaware of the complex nature of reality to which one must ultimately relate. It is the belief in the universality of the complex that motivates the search for the unifying principles; once they are understood, however, they can be applied to a very wide range of phenomena. Feynman explains this in the context of the gravitational law:<sup>23</sup>

...But the most impressive fact is that gravity is simple. It is simple to state the principles completely and not have left any vagueness for anybody to change the ideas of the law. It is simple, and therefore it is beautiful. It is simple in its pattern. I do not mean it is simple in its action — the motions of the various planets... can be quite complicated.... It is complicated in its actions, but the basic pattern or the system beneath the whole thing is simple. This is common to all our laws....

Finally comes the universality of the gravitational law and the fact that it extends over such enormous distances that Newton, in his mind, worrying about the solar system, was able to predict what would happen in an experiment of Cavendish, where Cavendish's little model of the solar system, two balls attracting, has to be expanded ten million million times to become the solar system. Then ten million million times larger again we find galaxies attracting each other by exactly the same law.

The use of simple concepts to explain complex phenomena has found particular application in the area of condensed matter physics, where the wide variety of structural, electronic, and dynamical properties of materials can all be related to only a few types of microscopic interactions; it is the cooperative nature<sup>24</sup> of these many-particle systems that makes for their intricate and interesting behavior. The cooperative phenomena exhibited by condensed matter systems (e.g., superconductivity, critical point phenomena) arises from the many-particle nature of these interacting systems; the same microscopic interactions acting on only one or two particles would give no hint of these cooperative effects. Thus, simple principles and laws can predict quite complex phenomena; this justifies the search for these underlying principles as a primary goal.

#### IV. THE INDIVIDUAL AND CREATIVITY

This paper has emphasized the role of objectification and quantification in both science and *Halakhah*. Both disciplines strive to formulate the laws that govern

the variety of phenomena of interest — the physical world in the case of science, and the subjective, spiritual world, in the case of the *Halakhah*. This focus does not mean that practitioners of either physical science or *halakhic* analysis are glorified technicians with little chance for creative insight. On the contrary, both Feynman and the *Rav* constantly stress the role of creativity and intuition in the formulation and application of the laws. In science, nature reveals itself through complex phenomena whose relation to the underlying laws is often quite indirect. The deduction of the laws and unifying principles from the experimental data requires the ability to look for simplicity in a seemingly intricate behavior. Similarly, the prediction and control of complex, cooperative systems composed of components whose microscopic interactions are simple, also require physical insight and the ability to make intuitive leaps; there are just too many degrees of freedom in such systems and one cannot proceed with a straightforward calculation that includes all the components and possibilities. In fact, the purely technical approach (often identified with a rigidly mathematical formulation without reference to the underlying physics) often leads to failure, as Feynman describes:<sup>25</sup>

Anyone who wants to analyze the properties of matter in a real problem might want to start by writing down the fundamental equations and then try to solve them mathematically. Although there are people who try to use such an approach, these people are the failures in this field; the real successes come to those who start from a physical point of view, people who have a rough idea of where they are going and then begin by making the right kind of approximations, knowing what is big and what is small in a given complicated situation.

In a similar manner, the *Rav* has emphasized the role of creativity in formulating the principles that underlie the *Halakhah*. The *halakhic* individual who tries to bridge the subjective, spiritual world with the objective *halakhic* model is definitely engaged in a creative pursuit that requires insight, intuition, and guesswork. This is especially true when analyzing Talmudic texts, where the legal principles, underlying philosophy, buttressing Biblical verses, and case studies are merged in a seemingly amorphous mass. The ability to deduce and formulate the principles underlying the Law requires the ability to simplify and amalgamate, while remaining consistent with all the textual material. However, to accomplish this, one must often first imagine what a simple formulation would look like and then investigate how related that concept is to the situation at hand.<sup>26</sup> This requires considerable creative insight, an activity, suggests the *Rav*, that is mandated by the *Torah* itself.<sup>27</sup>

The *Torah*...tells about the creation of the earth and heavens...not to reveal cosmological secrets...but rather to instruct *Halakhah Lema'aseh*. If the *Torah* begins with the story of creation...then there is a single *halakhic* conclusion that must be drawn: the individual is obligated to engage in the creative act of renewal of creation....God...left room for...man to participate in creation.

For the *halakhic* individual, this creativity manifests itself in the construction and realization of the ideal, model world and its correlation with the real world. While *Kabbalah* repairs the defects inherent in creation by raising the world to the heavens, to the source of purity, the *Halakhah* fills the void by bringing transcendence to this world.

It is interesting to note that the desire to simplify and unify which is common to both science and *Halakhah* derives not only from a "belief" that although the observed phenomena are complex, the underlying laws are simple, but also from an aesthetic sense of beauty and completeness. However, this sense must be tested against experiment in science and against known Mosaic laws (undisputed Biblical law, *Halakhah L'Moshe Mi'Sinai*) in *Halakhah*.

Finally, I would like to return to the question of the relationship of the scientist and the artist or the *halakhist* (*Ish Hahalakhah*), and the spiritualist or person of religion (*Ish Hada'at*). The scientist's message to the artist might be one that explains the aesthetic nature of the scientific theory and the creative aspects of the quest. In addition, scientific understanding and the related technological development can be a useful servant to the arts. Is there a similar relationship between *Ish Hahalakhah* and *Ish Hada'at*? The *Rav's* message is that the *Halakhah* certainly provides us with a norm that objectifies the subjective, spiritual world but that this norm only hints at the underlying wealth of ideas and emotions that exist. In fact, he emphasizes that the particular embodiment of the norm (i.e., the "reason" for the precise nature of some of the laws) is not unique and that the connection between the objective and subjective worlds could have been accomplished with a variety of methods. This of course is why the emphasis on the conceptual formulation of the *Halakhah* as opposed to its detailed implementation is so important. The *Rav* highlights these ideas in a discussion of the comment by Maimonides<sup>28</sup> that while the commandment of blowing the *shofar* on the New Year must be taken at its face value, the act of *shofar* blowing hints at repentance and reawakening of the individual:<sup>29</sup>

...by exploring the norm retrospectively, through vectorial hints which point toward subjectivity, the religious act with its unique structure retains its full autonomy....His (Maimonides) view that the *shofar* alludes

to repentance and self-examination is not a classical causal interpretation based upon a two-valued logic which entails necessity...there is no relational necessity between the sounding of the shofar and conversion. It does not follow that the sounding of the shofar is a necessary and sufficient means for the end of inspiring man to penitence and conversion. The call to repent could have been realized in many ways and there is no necessary reason why the *Torah* selected the means of sounding the shofar. Hence the message of repentance, which for Maimonides is implied in the sounding of the shofar, cannot serve as the cause of the commandment...but it must be apprehended rather as an allusion to a correlated subjective aspect....The reconstruction method does not operate with the principle of necessity. It neither claims that the subjective counterpart could only be crystallized in one particular way, nor does it explain how it was finally reflected in its objectified form. It merely points at the stationary trail left behind...and indicates parallel tendencies in both the subjective and objective orders.

Thus, a thorough study of even "dry" Talmudic legalisms yields insight into the subjective reality of a deep and meaningful religious experience. However, these links are always indirect and somewhat tentative. It is impossible to do anything more than hint at or suggest the nature of the link between the objective act and the subjective counterpart, since the *Halakhah* is an attempt to connect the finite, physical world with the infinite, sublime reality of its Creator — a connection that is logically absurd, but spiritually necessary for the God-seeking individual.

#### NOTES

- 1 Feynman received the Nobel Prize for Physics in 1965 for his work on the theory of quantum electrodynamics. Every student of physics is familiar with his introduction of Feynman diagrams to systematize perturbation theory in a very physical manner. In addition, the "Feynman Lectures in Physics" first given at Cal Tech (and published by Addison-Wesley in 1966) presented the excitement and wonder of both classical and modern physics to a freshman audience. The *Rav* instructed several generations of rabbinical scholars and leaders at Yeshiva University and conducted lectures for the general public in both New York and Boston. His audiences sat spellbound for hours at a time at these lectures in which abstract *halakhic* thinking was often synergised by its connection to philosophical and *aggadic* material. His philosophical writings describe a wide range of religious experiences and modalities (e.g., *Ish HaEmunah*, *Ish HaHalakhah*).
- 2 In a practical sense, this allows the scientist not only to understand existing phenomena, but also to predict and to apply the knowledge obtained from quantitative models of physical

systems. The *halakhist* can similarly use the objective methodology of the *Halakhah* to deal with novel situations.

- 3 A termed coined by the *Rav* in his essay *Ish HaHalakhah*, which describes in great detail the worldview of the *halakhic* individual.
- 4 Richard Feynman, *The Character of Physical Law* (Cambridge, MA: MIT Press, 1973), p. 13.
- 5 Richard Feynman, Robert Leighton & Matthew Sands, *The Feynman Lectures on Physics*, Vol. 1, NY: Addison-Wesley, 1966), pp. 3-6.
- 6 Rabbi J. B. Soloveitchik, *Ish HaHalakhah* (Jerusalem: Jewish Agency, 5738 [1978]), p. 14. In this article, the Hebrew words are rendered in my own free translations.
- 7 Rabbi J. B. Soloveitchik, *The Halakhic Mind* (London: Seth Press, 1986), p. 85.
- 8 Soloveitchik, *ibid.*, p. 88.
- 9 Soloveitchik, *ibid.*, p. 92.
- 10 Soloveitchik, *ibid.*, p. 94.
- 11 Soloveitchik, *ibid.*, p. 78.
- 12 Rabbi J. B. Soloveitchik, *Ma Dodech Medod* (Jerusalem: Besod Hayachid Vehayachad, Orot, 5736 [1976]), p. 220.
- 13 Feynman, *The Character of Physical Law*, p. 37.
- 14 Rabbi Zvi Schechter, *Nefesh HaRav* (Jerusalem: Reishit Jerusalem, 5744 [1994]), p. 223.
- 15 Feynman et al., *The Feynman Lectures on Physics*, Vol. 1, pp. 1-1.
- 16 Soloveitchik, *Ish HaHalakhah*, p. 27.
- 17 Feynman et al., *ibid.*, pp. 1-1.
- 18 Soloveitchik, *Ish HaHalakhah*, p. 31.
- 19 Feynman et al., *The Feynman Lectures on Physics*, Vol. 1, pp. 2-1.
- 20 Soloveitchik, *Ma Dodech Medod*, p. 228.
- 21 Soloveitchik, *ibid.*, p. 224.
- 22 Soloveitchik, *ibid.*, p. 225.
- 23 Feynman, *The Character of Physical Law*, p. 30.
- 24 By cooperative behavior one generally means that the system contains many particles or other degrees of freedom which interact with each other. Because, for example, particle A interacts with B and B interacts with C, etc. there can be long-range effects; particle C is indirectly influenced by the physical state of particle A. In systems with a thermodynamically large number of components, the range of these indirect interactions and their net result can be huge, qualitatively changing the behavior of the interacting, many-particle system in comparison with that of two or three particles. Nobel physicist P. W. Anderson of Princeton University called this effect "More is Different."
- 25 Feynman et al. *The Feynman Lectures on Physics*, Vol. 1, pp. 39-2.
- 26 An often useful exercise is to examine all the possibilities for the reasoning behind the various legal opinions in a Talmudical case even before identifying those opinions with a specific Talmudic scholar or commentator.
- 27 Soloveitchik, *Ish HaHalakhah*, p. 84.
- 28 Maimonides, Code (*Rambam, Mishneh Torah*), Laws of Repentance, Chapter 3, s 4.
- 29 Soloveitchik, *The Halakhic Mind*, p. 94.