

## Review Essay

*Torah, Chazal and Science* by Rabbi Moshe Meiselman (Lakewood: Israel Bookshop Publications, 2013) 887 pp.

**By: NATHAN AVIEZER**

It is accepted throughout the Torah world that in the realm of *halakha*, the rulings of *Hazal* are binding on every Jew because *Hazal* received their authority in matters of *halakha* from the Torah. In the present review essay, however, we are discussing something entirely different. Our subject here are the words of *Hazal* that lie *outside the realm of halakha*. These include their statements about nature, science, medicine, and history. Are these statements of *Hazal* also binding on us?

This question is the subject of several books that have appeared in recent years: “*Sefer Hayyim be-Emunatom: Ha-Emuna be-Hazal u-ve-Divreibem ha-Kedoshim*” (Hebrew, 1996) by Rav Reuven Schmeltzer, “*Thinking About Creation: Eternal Torah and Modern Physics*” (2001) by Rav Andrew Goldfinger, and has recently been analyzed in great detail in the 887-page book “*Torah, Chazal, and Science*” by Rav Moshe Meiselman.

These three books have a common theme, namely, that every word of *Hazal* was divinely inspired, and therefore, must be accepted by every Jew as absolutely true.

In the words of the author of the book under review (p. 107): “A major thesis of this book is that if *Hazal* make a definitive statement regarding science, it means that they know it to be unassailable.” Moreover, we are told that to think otherwise is an act of heresy. Rav Schmeltzer

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even adds in a footnote that heretics are to be executed! Although the present author does not suggest such drastic measures, he leaves no doubt in the mind of the reader that questioning the infallibility of *Hazal* puts one outside the pale of Torah *hashkafa*. This judgment applies to every single one of *Hazal's* definitive statements about science.

Rav Moshe Meiselman is well qualified to discuss both science and Torah. He holds a doctorate in mathematics from MIT and is the Rosh Yeshiva of Yeshivas Torat Moshe in Jerusalem. Nevertheless, I must respectfully disagree with the contents of this book.

Three major themes of his book will be discussed in this review.

1. What is the status of the statements of *Hazal* that lie outside the realm of *halakha*? Are all such statements correct, as the author asserts?
2. Is modern science reliable to assess the validity of the statements of *Hazal*? Is science basically unreliable and constantly changing, as the author asserts?
3. What is the source of *Hazal's* knowledge of science? Did *Hazal* derive their knowledge from the Divine, as the author asserts?

### **1. What is the status of the definitive statements of *Hazal* that lie outside the realm of halakha?**

The author emphasizes throughout the book that every definitive statement of *Hazal* has to be accepted as true, *regardless of topic*. “All of *Hazal's* definitive statements are to be taken as absolute fact [even] outside the realm of *halakha*” (p. 634).

It is generally assumed that *Hazal's* statements about science reflect the scientific understanding of their time and do not stem from divinely imparted wisdom. It is precisely this assumption that the author wishes to uproot.

#### **Do bats lay eggs?**

We begin with a statement of *Hazal* about science that seems to be incorrect, and then examine how the author deals with this apparent contradiction to his thesis. The statement in question may seem of minor importance, but the conclusions that can be drawn from the author's handling of *Hazal's* statement are extremely revealing.

*Bekhorot* 7b states (following Soncino): “Our Rabbis taught: Whatsoever gives birth, gives suck. And whatsoever lays eggs, supports its brood by picking up food for it, except the bat, for although it lays eggs, it gives suck to its young.” One recasts this passage into more familiar English by

noting that a creature that “gives suck,” that is, nurses its young with milk, is called a mammal. The passage then reads as follows:

*Hazal* taught that every creature that gives live birth is a mammal, and every creature that lays eggs, is not a mammal, except for the bat, which is a mammal that lays eggs.

This statement of *Hazal* contradicts the well-known fact that the bat is *not* an egg-laying mammal; bats give live birth just like other mammals. The author devotes Chapter 24 (pp. 329–37) to dealing with this question.

The author begins by commenting, quite correctly, that the word “*ataleif*” need not mean a bat. The specific animal meant by any given Hebrew name is often unclear. But this comment does not help much because all mammals give live birth.

But wait! That’s not quite correct. In Australia, naturalists discovered two types of mammals that *do* lay eggs, the duckbilled platypus and the spiny anteater. But also this does not help much. As the author himself points out, the *ataleif* of *Hazal* cannot refer to the duckbilled platypus, because Australia was not discovered by Europeans until the sixteenth century and the duckbilled platypus was unknown to *Hazal*. The author presents the following interpretation to solve the problem (pp. 334, 337):

*Hazal’s* knowledge of the animal kingdom was not based on mere experience, but on their understanding of the spiritual underpinnings of the world... In *Hazal’s* time, no such creatures [egg-laying mammals] had been seen, but *Hazal* knew from their study of the ‘blueprint’ of Creation that such animals must exist... In their day [time of *Hazal*], no one had ever seen one [duckbilled platypus], but *Hazal* knew that somewhere in the world, they must exist [because] our *Chachamim* received their information from a higher source.

With this interpretation, the author has elevated *Hazal* from lacking basic knowledge of European/Asiatic zoology to having profound understanding of zoology in the then-unknown continent of Australia! According to the author’s interpretation, this passage of the Talmud is to be understood as follows:

*Hazal* taught that every creature that gives live birth is a mammal, and every creature that lays eggs, is not a mammal, except for an egg-laying mammal that must exist somewhere in the world.

Note what the author has done. He has replaced the definitive statement of *Hazal*, “the *ataleif* (some known mammal) is an egg-laying mammal,” by the very different statement, “egg-laying mammals must exist somewhere in the world.” The author made this replacement because he

realizes that the definitive statement of *Hazal* is incorrect. The *ataleif* (some known mammal) does *not* lay eggs.

The problem with the author's replacing *Hazal's* words with an interpretation is that he emphasizes in his book that it is *forbidden* to replace the plain meaning of the words of *Hazal* by an interpretation. "It is the obligation of every Jew to accept everything *Hazal* have told us" (p. 635), and again, "all of *Hazal's* definitive statements are to be taken as absolute fact [even when] outside the realm of *halacha*" (p. 635), and again, "in natural science, *Hazal's* wisdom was superior to that of any researcher because it was derived from our Divinely-based tradition" (p. 294).

In spite of his assertion that "every definitive statement of *Hazal* is true" (p. 306), the author recognizes that the definitive statement of *Hazal* that "the *ataleif* (known mammal) is an egg-laying mammal" is *not true*. Therefore, he replaces *Hazal's* definitive statement by a very different statement that *is true*, namely, "egg-laying mammals exist somewhere in the world."

The author writes that "It is the obligation of every Jew to accept everything *Hazal* have told us, regardless of the subject" (p. 635). Is this really my obligation? In fact, we shall see that Torah sources state quite clearly that *Hazal's* pronouncements in science reflect the scientific knowledge of their day.

## 2. Is science reliable?

Throughout the book, the author emphasizes that all scientific knowledge is transitory ("scientific theories are subject to continual revision," p. 580). This implies that one may disregard any contradictions between statements of *Hazal* and scientific claims because the science of today will anyway end up on the dunghill of tomorrow. The author supports this assertion with a number of examples. We shall examine his assertion and his examples in some detail.

### a. Are scientific theories transitory?

The author asserts that change is the most conspicuous feature of science and all scientific theories eventually become discarded and are replaced by new paradigms.

The facts are quite otherwise. Every competent scientist can distinguish between speculative theories and those that are supported by a vast array of scientific evidence. The latter have an excellent record for longevity. For example, the theory of relativity and the quantum theory have

enjoyed unqualified success since their inception a century ago in explaining hundreds of diverse physical phenomena. Well-established theories become refined and extended, but are never simply discarded as being wrong.

The excellent track record of well-established scientific theories was noted by Nobel laureate Steven Weinberg. Professor Weinberg categorically denies that there are any recent examples of experiments that refute accepted scientific theories that had become part of the standard consensus of physicists (*Dreams of a Final Theory*, p. 102): “*There are no such examples whatsoever in the past hundred years*” (emphasis in original). If not a *single* well-established theory of physics has been refuted in the past century, one should listen attentively when scientists speak.

### **b. Was Einstein wrong?**

The author writes the following (p. 581):

Over the past hundred years, Einstein’s theory of relativity has been tested thousands of times. It is difficult to find a more solidly based scientific doctrine than special relativity. One of its implications is that nothing can travel faster than light. Recently, however, a group of physicists from the European Center for Nuclear Research (CERN) reported that they fired neutrino beams to a lab 750 kilometers away and found that the beams arrived 60 billionth of a second faster than light...if these findings stand, the foundations of physics will have been shaken and a new theory will have to be formulated to replace relativity.

These results were reported in 2011. Because of their dramatic implications (“the very foundations of physics will have been shaken”), these results were front-page news throughout the world. However, the physics community was convinced that something must be wrong with the experiment. Einstein’s theory is too solidly based to be wrong.

It did not take long for scientists to discover that in the measuring apparatus, a fiber cable had been improperly attached. In simple terms, there was a loose wire. The apparatus was fixed, the experiment was repeated, and the new results were in *exact agreement* with Einstein’s theory, just as all physicists were convinced would be the case. On 8 June 2012, CERN research director Sergio Bertolucci made an official announcement in the name of the research team that the initial reported results had been in error due to equipment failure and should be disregarded. On 12 July 2012, the research team published their new results for neutrino speed showing complete agreement with Einstein’s theory. Unfortunately, these corrected results do not appear in the book under review.

**c. Has the Copernican heliocentric theory of planetary motion been invalidated?**

The author writes the following (p. 580):

“General relativity invalidated Copernicus.”

The reader must surely raise an eyebrow over the author’s above statement because he or she doesn’t remember hearing that the heliocentric theory of Copernicus and Kepler has been invalidated. Have scientists abandoned their long-held view that the planets revolve around the Sun in elliptical orbits with the Sun positioned at one focus of the ellipse? Of course not! I will explain what the author means by his statement.

If there were only two heavenly bodies, say, the Earth and the Sun, then which body moves and which body is stationary is arbitrary and is determined by where one places the origin of the reference frame. If one places the origin in the Sun, then the Earth is described as moving around the Sun, but if one places the origin in the Earth, then the Sun is described as moving around the Earth. The author attributes these findings to Einstein’s theory of general relativity. In fact, this obvious result was well-known to Copernicus, and probably also to Euclid and Archimedes in ancient Greece.

However, the above result is correct if there are *only two* heavenly bodies, the Sun and *one* planet. But the task of Copernicus and Kepler was to explain the orbits of *all* the planets. They showed that *all* the planetary orbits are correctly given *only* by the heliocentric theory. Even if one places the origin of the reference frame at the center of the Earth, *the orbits of the other planets are nevertheless described by ellipses revolving around the Sun*. In their futile attempts to describe planetary orbits as circles revolving around the Earth, medieval astronomers introduced many arbitrary parameters, called *epicycles*. Although over 80 epicycles were eventually introduced, the geocentric theory *still* couldn’t account for the accurately known planetary orbits. Copernicus and Kepler swept away all the imaginary epicycles and accounted precisely for *all* the planetary orbits without having to introduce any arbitrary parameters. To this very day, the Copernicus-Kepler heliocentric theory is taught in every course in astronomy.

Finally, a word should be said about the failed geocentric theory of the solar system, in which it was erroneously assumed that *all* planetary orbits could be described as circles revolving around the Earth. Is that not an example of a scientific theory that was universally believed for over a thousand years, and then replaced by the very different heliocentric theory?

The answer is “no!” The geocentric theory was universally accepted for a millennium on religious grounds alone. The *beliefs* of the Church

demanded that man's place *must be* at the center of the universe. *Religious beliefs* required that planetary orbits *must be* circular because the circle is the ideal geometric figure and the G-d's heavens must behave in the ideal manner. Finally, the first *scientific* theory of planetary motion—the heliocentric theory—was proposed and it successfully explained *all* the planetary orbits.

**d. Has Newtonian mechanics been invalidated by Einstein?**

The author writes the following (pp. 580, 589):

Newton's theories [of mechanics] were supposedly proven beyond doubt in countless experiments, yet they were subsequently invalidated by Einstein... [Newtonian mechanics] is now believed to be false and therefore cannot be invoked for explanatory purposes.

Perhaps the author is correct. Wasn't Newtonian mechanics overturned by relativity theory in 1905 and overturned again by quantum theory in 1926?

Not at all! Newtonian mechanics was *generalized* by these theories, and was shown to be *the correct limiting form* for low velocities (even a thousand miles per second is *slow* in this context!) and for large masses (even a speck of dust weighing a trillionth of a gram is a *large mass* in this context!). Far from being "false," Newton's theory is so accurate within its wide regime of validity that to this day, every university student of physics is required to learn Newtonian mechanics, which is "invoked for explanatory purposes" by every professional physicist.

Physics textbooks continue to teach Newtonian mechanics because it is extremely accurate in everyday situations, where relativistic corrections are negligible. Successful scientific explanations are based on the recognition that many effects are so very small that they should be ignored and *only* important effects should be considered.

**e. Is the Big Bang theory on the way out?**

The branch of science that deals with the origin and development of the universe is called cosmology. The modern theory of cosmology is the Big Bang theory. This theory is supported by a vast array of scientific evidence, accepted by all mainstream cosmologists, taught in every university, and the two scientists who discovered the major evidence supporting this theory were awarded the Nobel Prize in Physics.

We Torah-and-Science fellows are delighted with this theory because it agrees *in every detail* with the Torah account of the origin of the universe as described on the First Day of Creation (see, for example, "*In the Beginning?*").

Even secular cosmologists mention the close correspondence between the first chapter of Genesis and the Big Bang theory without, of course, ascribing any meaning to it (see, for example, *The Big Bang*, by cosmologist Joseph Silk of the University of California).

However, the author thinks that science shouldn't meddle in cosmology, and to support his view, he quotes (p. 268) several passages from a letter published in the journal *New Scientist* to the effect that the Big Bang theory is on the way out.

The Big Bang theory relies on a growing number of hypothetical entities, things that we have never observed—dark matter and dark energy are the most prominent examples.... What is more, the Big Bang theory can boast of no quantitative predictions that have subsequently been validated.

Reading the entire letter makes clear that its main point is to complain of lack of funding for the writer's pet theory of cosmology. He writes, "Today, virtually all financial and experimental resources in cosmology are devoted to big bang studies. Giving financial support only to projects within the framework of the big bang undermines a fundamental element of the scientific method, etc. etc."

The reason that the writer's theory of cosmology does not receive funding is that cosmologists have studied his ideas thoroughly and have rejected them. The Big Bang theory receives all the funding because the scientific community is convinced that this is the only theory that provides the correct explanation for the origin of the universe.

Let's now examine the scientific criticisms of the writer, which are quoted by the author as reasons to doubt the validity of the Big Bang theory.

**Writer:** The Big Bang theory relies on the existence of dark matter and dark energy, which are hypothetical entities that have never been observed.

**Reply to Writer's Criticism:** Neither dark matter nor dark energy has anything to do with the Big Bang theory. Dark matter was introduced to explain the rotation rate of the galaxies. Dark energy was introduced to explain the acceleration of distant galaxies.

**Writer:** The Big Bang theory has never made any quantitative predictions that were later confirmed.

**Reply to Writer's Criticism:** Two satellites were launched into space to check the detailed predictions of the Big Bang theory regarding the spectrum and the anisotropy of the primeval light-ball. These are the COBE satellite launched in 1989 and the WMAP satellite launched in 2001. The



data from both satellites confirmed the predictions of the Big Bang theory *in complete detail*. According to the *Scientific American* (February 2004, p. 30), “The Big Bang theory works better than ever.”

The letter is riddled with scientific errors. Nevertheless, the author of the book under review quotes from this letter as evidence that serious scientists doubt the validity of the Big Bang theory.

**f. Have the constants of nature changed in the course of time?**

The author writes the following (p. 498):

The assumption of the constancy of natural processes throughout the ages has been disputed by some of the greatest names in science.

The author supports his view by quoting the proposal of Paul Dirac that the constants of nature may be changing. Paul Dirac is indeed “one of the greatest names in science” and, therefore, his proposal was examined very carefully by the scientific community.

If the constants of nature had been different in the past, there would be measurable effects that can be observed today. Since Dirac made his proposal in 1937, an intensive search has been carried out to find any effects that could be attributed to a change in the constants of nature. The detailed search has not revealed the slightest support for Dirac’s proposal. As a result, this proposal has been abandoned by almost everybody.

The author writes that the assumption of the constancy of the constants of nature “has been disputed by some of the greatest names of science.” However, he does *not* write that this assumption has been thoroughly checked by many scientists who found absolutely no evidence to support the assumption.

**g. Is guesswork invariably involved in all of science?**

The author writes that one cannot have confidence in scientific theories because all of science is imprecise and involves guesswork (p. 573):

The purpose of scientific ‘lawmaking’ is to discover principles by which data can be organized such that further incidences can be predicted. The process involved is not an exact, deductive one, but necessarily an imprecise, inductive one. As with all inductive reasoning, there is invariably a certain degree of guesswork involved. Consequently, the resulting laws are always tentative, awaiting further confirmation and refinement. Very little in science is really cast in stone.

The author is making the following point. Since science is based on induction, all scientific theories are based on a finite number of data points.

However, there exist an *infinite* number of theories that can explain a *finite* set of data. (In technical language, one can draw an infinite number of continuous curves through any finite number of points.) Therefore, implies the author, there is no reason to think that today's scientists were lucky enough to have guessed the right theory from the infinite number of possibilities.

Only a non-scientist would imagine that for each set of measurements, there are a large number of theoretical explanations just lying around, waiting for the scientist to choose the one that strikes his or her fancy. This idea is so utterly removed from reality as to be ludicrous. In truth, scientists spend most of their time struggling to formulate *some theory* that might explain the data.

It is true that scientists will never achieve the "final truth," but there are good reasons for thinking that our understanding of the physical world is becoming progressively more accurate. The vast technology of the modern era is based on the scientific theories of today. If today's science is really "imprecise" and based on "guesswork," then it appears that our "guesses" are very good indeed!

#### **h. Has nature changed?**

The author states that if there ever would be a clear difference between a statement of *Hazal* and an observation of nature, one should accept the statement of *Hazal* and conclude that nature has changed (p. 253):

*Hazal* were describing realities that they lived with on a daily basis. They were not ivory-tower academicians making armchair speculations. They had firsthand knowledge of both human and animal reproductive cycles. They had firsthand knowledge of animal anatomy. *If our observations do not always match theirs, it is clearly because realities have changed* (emphasis added).

The author applies this principle to the statement of *Hazal* that a baby who is born during the ninth month of pregnancy will die, but if the baby is born *earlier*, it will live (*Yevamot* 42a). This statement of *Hazal* contradicts the view of the medical profession that the longer the fetus develops in the womb, the greater are the chances for the birth of a healthy baby. The author resolves this contradiction in the following way (p. 252):

It was already evident that the situation had changed and that babies born within the ninth month were no longer nonviable... many aspects of nature have changed since *Hazal's* day.

The author has harsh words to say to those scientists who do not accept his view that a radical change in human physiology has occurred within the last two thousand years (p. 253): "It is pure hubris on the part

of certain academics that cause them to deny the validity of *Hazal's* observations.”

### 3. What is the source of *Hazal's* knowledge of science?

A major theme of this book is that *Hazal's* knowledge about nature/science is Divine knowledge and therefore absolutely true because “our *Hakhamim* received their information from a higher source” (p. 337), and again, “in natural science, *Hazal's* wisdom was superior to that of any researcher because it was derived from our Divinely-based tradition” (p. 294).

#### Were *Hazal* blessed with *ruah ha-Kodesh*?

The Talmud (*Sanhedrin* 11a) gives a definitive *negative* answer to the above question (following Soncino):

*Hazal* taught: Since the death of the last Prophets, Haggai, Zechariah and Malachai, *ruach hakodesh* (the Divine Spirit) departed from Israel.”

#### Did *Hazal* obtain their knowledge about the natural world from divine sources?

The author gives an *affirmative* answer to the above question: “in natural science, *Hazal's* wisdom was superior to that of any researcher because it was derived from our Divinely-based tradition” (p. 294).

However, the Talmud (*Sanhedrin* 5b) gives a *negative* answer to the above question:

[Talmudic Sage] Rav stated, ‘I spent eighteen months with a shepherd in order to learn which blemish [on a firstborn animal] is permanent and which blemish is temporary.’

If *Hazal's* “wisdom in natural science...was derived from Divinely-based tradition,” as the author states, why did Rav have to spend 18 months with a shepherd to acquire the knowledge of zoology that is necessary to rule on matters of *halakha*?

#### Did *Hazal* consider their knowledge of astronomy to be more reliable than the knowledge of the Greeks?

The Talmud (*Pesachim* 94b) gives a *negative* answer to the above question:

*Hazal* taught that the Sun travels beneath the sky by day and above the sky at night, whereas the Sages of the nations taught that the sun

travels beneath the sky by day and beneath the earth at night. Rabbi [Yehuda HaNasi] said that their view is preferable to ours.

Moreover, on the same page of the Talmud, relating to a different astronomical question, a disagreement is recorded between Rabbi [Yehuda ha-Nasi] and R. Aha ben Jacob regarding whether the Sages of the nations are correct or whether *Hazal* are correct.

It follows from these Talmudic passages that *Hazal* did *not* consider their knowledge of astronomy to be more reliable in principle than that of the Greeks. In each case, the astronomical matter was argued on the basis of the known facts and *on this basis alone*, a decision was reached regarding whose opinion is probably correct.

Since the above Talmudic passages are completely contradictory to the position of the author, he presents various ways by which his opinion might be justified (p. 145):

According to many commentaries, these [Talmudic discussions] are not to be taken at face value. A number have suggested that *Hazal* were not speaking of the physical sun, but of its spiritual counterpart. But even among those who take these discussions literally, explanations vary. Rama interprets them as highly technical astronomical analyses expressed in symbolic terms.

It is ironic that although the author repeatedly emphasizes throughout his book that the definitive words of *Hazal* are *always* to be understood literally, he here suggests that these definitive words of *Hazal* should *not* be taken literally (“not to be taken at face value...not the physical sun but its spiritual counterpart...symbolic terms”).

In *Guide for the Perplexed*, Part II, Chap. 8, Rambam discusses the passage in *Pesahim* 94b, and he clearly understands the passage in its plain literal meaning. According to Rambam, *Hazal* *conceded* that they were wrong and that the Sages of the nations were right (following Shlomo Pines’s 1933 translation from the Arabic):

In these astronomical matters, *Hazal* preferred the opinion of the Sages of the nations to their own. For *Hazal* conceded: “The Sages of the nations are right.” And this is correct. For everyone who argues regarding speculative matters does so according to the conclusions to which he was led by his speculation. Hence, the conclusion whose demonstration is correct is believed.

Elsewhere in the *Guide* (Part III, Chap. 14), Rambam repeats his view that the scientific knowledge of *Hazal* reflected the science of their time:

Do not expect that everything that *Hazal* said concerning astronomical matters conforms to the way that things really are. At their time, mathematics was imperfect. *Hazal* did not speak as transmitters of sayings of the Prophets, but rather, because they were men of knowledge in these fields or because they heard these sayings from men of knowledge who lived in their times.

It is clear from these quotes that Rambam did not think that *Hazal* viewed themselves as having any Divinely-based knowledge about nature. It's all a question of whose opinion is based on sounder arguments, *Hazal* or the non-Jewish astronomers, and that is the opinion that *Hazal* accepted.

Rambam was not the only Torah authority to express such opinions. His son, Rav Avraham ben ha-Rambam, in his "*Letter Concerning the Aggadat of Hazal*," writes:

We are not obliged, because of the greatness of *Hazal* in matters of Torah and the Talmud in all its details, to defend them and uphold their views in all their sayings in science and astronomy.

The author seeks to dismiss this definitive statement of Rav Avraham ben ha-Rambam by suggesting (p. 100) that the passage may have been the work of a translator who "perhaps inserted this section" into the *Letter*!

A more modern Torah luminary who considered *Hazal's* scientific knowledge to be the science of their day was Rav Shimshon Raphael Hirsch, the leader of Orthodox Jewry in Germany in the late nineteenth century. Rav Hirsch was known for his vigorous opposition to any idea that strayed in the slightest from Torah *hashkafa*.

Rav Hirsch writes (*Trusting the Torah Sages*, Chap. 4):

The first principle that every student of *Hazal* must keep before his eyes is the following: *Hazal* were the sages of G-d's law. They did not especially master the natural sciences, geometry or astronomy, except insofar that they needed them for knowing and fulfilling the Torah. Their knowledge was not transmitted from Sinai... *Hazal* considered the wisdom of the gentile scholars equal to their own in the natural sciences. To determine who was right in areas where gentile scholars disagreed with their own knowledge, they did not rely on their tradition but on reason. Moreover, they respected the opinion of gentile scholars, admitting when the opinion of the latter seemed more correct than their own opinion.

We note the complete agreement between these words of Rav Hirsch, the writings of Rambam and of his son Rav Avraham.

### **Conclusion**

To conclude this review, I wish to state once again that *Hazal's* lack of modern scientific knowledge does not diminish in the slightest our respect for their greatness in matters of Torah. No one thinks that because *Hazal* were unaware of quantum field theory or pulsars, one need not accept their rulings in the realm of *halakha*. ❧