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## Threads of Reason

*A Collection of Essays on Tekhelet*

by Rabbi Mois Navon

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### ***About the Book***

This collection of essays is the result of research spanning more than a decade, motivated by nothing more than the desire to reach a clear understanding of the issues surrounding the rediscovery of *tebbelet* through the *Murex trunculus*. Is it possible to renew a biblical commandment without a *mesorah* (tradition)? Must religious objects, like *tzitzit*, be made from kosher substances? Does one violate the *melakbab* (Shabbat labor) of trapping when obtaining a snail on Shabbat? Bringing together biology and halakhah, chemistry and *aggadah*, archeology and theology – and applying careful consideration and logical reason – these essays seek to address the numerous questions that arise in the endeavor to revive this unique commandment. And as *tebbelet* is a commandment that has been forgotten for over 1300 years, each essay is colored with the marvel of a lost biblical commandment returned anew to the Jewish people. This collection of essays, then, can be seen as a group of threads – threads of reason – spun into a cord strong enough to bind a new generation in the fulfillment of an ancient commandment.

## The *Hillazon Baraita*

The *hillazon* is this: its body is like the sea, its creation is like fish, it comes up once in seventy years and with its blood one dyes *tebbelet* – therefore it is expensive.

Menahot 44a

At first glance, this *baraita* appears to be a description to help fishermen identify the coveted catch that is the source of *tebbelet*. However, as explained by R. Yehuda Rock in his essay, “The Renewal of Tekhelet,”<sup>1</sup> the ambiguity of this description makes it completely ineffective for identifying the *hillazon*. Which body? Which sea? Which fish? Once in seventy years? If practical advice was the intent, clearly more indicative signs could have been given.

To understand the import of the *baraita*, it is crucial to recognize that the statement is not simply a list of features but rather a conditional construct composed of a “*reisha*” (initial clause) and a “*seifa*” (concluding clause) – the two being demarcated clearly by the dividing word “therefore.” The *reisha* contains four conditions which render the consequence that, as revealed in the *seifa*, the dye is expensive.<sup>2</sup> Accordingly, the descriptors in the *baraita* serve one simple purpose: to explain why the dye is expensive.

Given this, R. Isaac Herzog, in his doctoral thesis, “Hebrew Porphyrology,”<sup>3</sup> notes that declaring the dye to be “expensive” is simply out of place in a formal halakhic definition. He explains that it would, however, make sense as a letter sent to the Diaspora to inform them about the expense associated with the creature

responsible for the *tekbelet* dye. Therefore, one should not view the list of conditions as the halakhic criteria of the *hillazon*, but rather as a list of reasons that justify, to consumers in distant lands, the high price they must pay for their sacred strands of blue.

When the *baraita* is understood in this context, each of the four characteristics of the *hillazon* – the conditions of the *reisha* – designedly support the conclusion. That is, while they are ambiguous as physical descriptors of a specific creature, the four conditions explain why the creature is expensive. And, as will be noted in the analysis below, the *Murex trunculus* neatly conforms to each descriptor.

## **Analysis**

“Its body is like the color of the sea”

This statement is fraught with ambiguity if taken as a precise biological description. To begin with, given that the *hillazon* is described elsewhere<sup>4</sup> as having both an outer body (i.e., a shell) and an inner body (i.e., the creature itself), the term “body” leaves one wondering which “body” is being referenced. In the absence of a description of both the inner body and the outer body, it is reasonable to assume that the *baraita* refers to the animal as a whole; thus the “body” means that which is most readily apparent to the casual observer – i.e., the shell.<sup>5</sup>

Furthermore, whether the *baraita* is intended for fishermen or, as proposed, for laymen in order to explain the expense occasioned by the difficulty of obtaining the *hillazon* in its natural habitat, the *baraita* refers to the snail *in situ*, body and shell together, and not the inner body after it has been removed from its shell. And in referring to the shell, it is safe to say that the *baraita* describes how it appears in its natural environment and not buffed and polished in a laboratory.<sup>6</sup>

This brings us to the next part of the phrase which describes the body as being “like the color of the sea.” The sea is really a myriad of colors, ranging from black to clear and including all the various shades of blue and green in between. Certainly a more exact definition could have been provided if the intention was a specific color (e.g., “its color is blue-green”).

Reading the phrase, “its body is like the color of the sea,” in its simplest sense leads only to confusion. However, if the statement is understood within the context of the *baraita* as a whole, where this is but one of a number of points

explaining the great expense of the *hillaẓon* and its dye, then the very ambiguity of the *baraita* actually serves its purpose. That is, this description tells its readers that the *hillaẓon* is expensive because it is extremely difficult to find, camouflaged as it is by the colors of its environs. This description accords well with the *Murex trunculus*, which naturally takes on the color of the sea fouling organisms covering the bottom of the sea where it lives.<sup>7</sup> In consonance with this description, R. Rock explains that “sea” often means specifically “sea-bottom” as used, for example, in Isaiah (11:9) and Habakkuk (2:14).<sup>8</sup>

“Its creation (*briato*) is like a fish”

The term “*briato*” is enigmatic. Some have suggested the term to mean “reproduction,” meaning it reproduces by laying eggs as fish do. But this interpretation is decidedly weak, given the more common terms for reproduction such as: “*piria*,” “*rivia*” or “*sbritzza*.” Rashi (ad loc.) translates the term to “*diokno*,” meaning it has the “form” of a fish. R. Eliyahu Tavger notes that fish do not have a unique “form” common to all and thus the intent must be that the *hillaẓon* resembles a fish in some manner.<sup>9</sup> R. Rock writes that the term “*briat hamayim*” (creations of the water) is found in the Mishnah (Mikvaot 6:7) where the Arukh explains the term to mean “fish and the like.”<sup>10</sup> Thus, *briat* simply implies a general classification of creatures, the phrase “*briato domeh ledag*” meaning a creature in the general classification of “fish” – i.e., creatures that live in the sea. Indeed, the Vilna Gaon notes that “everything in the sea is some type of ‘fish’ whatever its form may be” (Eliyahu Rabbah, Keilim 10:1).<sup>11</sup>

From this we conclude that the *hillaẓon* is simply a sea creature, a conclusion which fits most logically with our understanding of the *baraita* as justifying its expense. For, since the *hillaẓon* is a creature of the sea, the effort required to obtain it – and thus its expense – is far greater than if its habitat were on land. This characteristic, along with the others, serves to strengthen the conclusion that its dye is expensive. And, as is well known, the habitat of the *Murex trunculus* is the sea.

“It comes up once in seventy years”

Though some understand this point to imply that the *hillaẓon* is not to be found but once in seventy years, R. Gershon Hanokh Leiner explains that such an interpretation is untenable. He notes that the Gemara (Shab. 26a) states, “Nevuzaradan left ... the trappers of the *hillaẓon*,” upon which Rashi explains that

he did so “for the sake of the king’s garments.” R. Leiner argues that it would be unreasonable for Nevuzaradan, after exiling all the Jews from the land of Israel, to specifically leave these Jewish artisans to perform a task that can only be carried out “once in seventy years!”<sup>12</sup>

Investigating the figure of “seventy years,” we find that it refers to the average lifespan of man, as in, “The days of our life are seventy years” (Ps. 90:10). Accordingly, the expression “once in seventy years” is used in the Gemara to mean “once in a lifetime.”<sup>13</sup> Commenting on the words “once in seventy years,” Rashi (Hullin 89a, s.v. *she’ha’tekebelet*) adds, “from the sea”; that is, once in seventy years the *hillazon* comes up from the sea.

Putting it all together, the phrase can be understood to indicate that the *hillazon* washes up from the sea on to the shore once in a lifetime. On such a rare, “once in a lifetime,” occasion, one can simply stroll along the beach and collect the *hillazon* to make *tekebelet* for free. Otherwise, one must expend considerable effort to go out to sea and lay traps<sup>14</sup> for the creatures, waiting long enough to harvest the requisite number of snails to make a significant amount of dye.<sup>15</sup> All told, it is an expensive process resulting in an expensive final product.

The *Murex trunculus* once again matches this description, in that it does not crawl out onto the shore but remains at the sea bottom, only to be washed up from the sea – once in a lifetime – in a great storm.

“With its blood one dyes *tekebelet*”

Initially one might be inclined to understand this expression as purely informational – i.e., the blood of the *hillazon* is the source of *tekebelet*. However, given that each of the preceding three expressions comes to justify the conclusion, it is logical to assume that this statement also serves to explain the great expense.

Again, the conclusion reasons, “therefore ‘it’ is expensive.” In current versions of the *baraita* the ‘it’ is in the masculine (*daman*), referring to the expense of the *hillazon* itself.<sup>16</sup> In this case, the expression “with its blood one dyes *tekebelet*,” explains why the *creature* is so expensive, for not only does it require great effort to obtain, but most importantly, it is the source of the deeply desired dyestuff that is *tekebelet*.

There is, however, another version of the *baraita*, quoted by Rav Shmuel Ben Hofni Gaon in his “Book of the Laws of Tzitzit” (Ch. 9),<sup>17</sup> which has the “it” in the feminine (*dameha*), referring to the *tebbelet* dye.<sup>18</sup> Taken in context, this statement – “with its blood one dyes *tebbelet*” – says that the quantity of dyestuff rendered by the blood of a single *hillazon* is so minute that this too contributes to the great expense of the final dye product. Indeed, the volume of dyestuff extracted from the *Murex trunculus* is so small that approximately thirty snails are required to dye four strands of *tzitzit*.<sup>19</sup>

## **Conclusion**

In conclusion, the various ambiguities in the phraseology of the *baraita* argue most convincingly that its purpose cannot be to provide definitive physical characteristics of the *hillazon*. Rather, by examining the *baraita* in its constituent parts (i.e., *reisha* and *seifa*), we arrive at a cogent and comprehensive interpretation of the *baraita* in which each of the initial points serves to support the final conclusion: expense. Furthermore, understanding the *baraita* accordingly, we note that each of the definitions matches effortlessly with the *hillazon* that is the *Murex trunculus*.

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- <sup>1</sup> R. Yehuda Rock, “Renewal of Tekhelet and Issues on Tzitzit and Tekhelet,” *Techumin*, 16 (online expanded version: <http://tekhelet.com/pdf/rak.pdf>), p. 14, n. 57.
- <sup>2</sup> See, however, Rashi (ad loc., s.v. *lefikhabab*).
- <sup>3</sup> R. Herzog, “Hebrew Porphyrology,” in *The Royal Purple and The Biblical Blue* (Jerusalem: Keter, 1987), pp. 66-67.
- <sup>4</sup> Midrash Rabbah (Shir Ha-Shirim 4:11). Pesikta deRav Kehana, Ch. 11. Midrash Tehillim, Mizmor 23. For more on this issue, see my essay, “*HaPotzot* – Extracting the Dye from the *Murex trunculus*” (herein, p. 32).
- <sup>5</sup> Though the references to the *hillazon*’s outer body use the specific term “*nartik*,” the point made here still stands – i.e., if the intent of the *baraita* were to provide a precise physical portrait, it would be more than remiss not to include a description of the outer shell before proceeding to the inner body.
- <sup>6</sup> Israel Ziderman, “Reinstitution of the Mitzvah of Tekhelet in Tzitzit,” *Techumin* 9 (1988), p. 430.
- <sup>7</sup> On sea or marine fouling, see Ehud Spanier and Nina Karmon, “Muricid Snails and the Ancient Dye Industries,” *The Royal Purple and The Biblical Blue* (Jerusalem: Keter, 1987), pp. 180, 189. Baruch Stermen, “The Science of Tekhelet,” in *Tekhelet: Renaissance of a Mitzvah* (New York: YU Press, 1996), p. 69. Experience shows that while trying to collect these snails from the sea, oftentimes it is rocks from the sea floor that are picked up, as the snail appears just like them. They are, quite literally, like “the bottom of the sea.”
- <sup>8</sup> R. Rock, p. 14. Though a cursory rendering of “sea” might be the water itself, the context of the *baraita* implies the general habitat of the *hillazon* wherever it may be in the sea.
- <sup>9</sup> R. Eliyahu Tavger, “Ma’amar ha-Tekhelet,” in *Kelil Tekhelet* (Jerusalem, 1993), Appendix A.
- <sup>10</sup> R. Rock, p. 15, n. 57.
- <sup>11</sup> R. Herzog explains that from the sporadic allusion to the nature and characteristics of fish in the Gemara, no precise taxonomy can be inferred (p. 68).
- <sup>12</sup> See R. Leiner, “Sefunei Temunei Hol,” in *Sifrei ha-Tekhelet Radzzyń* (Benei Berak: Mishor, 1990), p. 3. R. Herzog points out that the Gemara (Shab. 26a) may be referring to the *hillazon* for *argaman* (p. 69). Nevertheless, it is clear to us today that the same snails that produce purple (*argaman*) when developed in the absence of sunlight, also produce blue (*tekhelet*) when produced in direct sunlight (Otto Elsner and Ehud Spanier, “The Past,

Present and Future of *Tekhelet*,” in *The Royal Purple and The Biblical Blue* [Jerusalem: Keter, 1987], p. 175).

- <sup>13</sup> Makkot 7a; Avodah Zarah 11b; Horayiot 10a; Bekhorot 8a; Kritot 6b; Me'ilah 11b. “[T]he expression is simply an arithmetic hyperbole of the kind which is pretty common in the Talmudim and Midrashim” (R. Herzog, p. 69).
- <sup>14</sup> Shabbat 75a. Similarly the ancients of other cultures used the same methods. See: Aristotle, *History of Animals* (5:15); Pliny, *Natural History* (9:37). See my essay, “*Ha-Zad Hillaẓon – Trapping the Murex trunculus*,” (herein, p. 51).
- <sup>15</sup> Since each snail only produces a minute quantity of dyestuff (see fn. 19), and it was necessary to make the dye immediately after the snails were killed, many snails had to be collected before the process could commence, as described by Aristotle: “Fishermen are anxious always to break the animal in pieces while it is yet alive, for, if it die before the process is completed, it vomits out the bloom [i.e., purges its dye]; and for this reason the fishermen keep the animals in creels, until they have collected a sufficient number and can attend to them at their leisure” (*History of Animals*, Book 5, part 15; [http://classics.mit.edu/Aristotle/history\\_anim.5.v.html](http://classics.mit.edu/Aristotle/history_anim.5.v.html)).
- <sup>16</sup> See R. Herzog, p. 66.
- <sup>17</sup> Quoted in R. Tavger, Appendix A.
- <sup>18</sup> See R. Herzog, p. 66.
- <sup>19</sup> Empirical observation in the Ptil Tekhelet factory. See M. V. Orna, et al., “Coordination Chemistry of Pigments and Dyes of Historical Interest,” *ACS Symposium Series* (1994), which records that it took 12,000 mollusks to render 1.5 grams of dye. “[T]he light violet purple ... a pound of it was sold for a hundred deniers; ... the Tarentine red purple ... of the same price. But after it, came the fine double died purple of Tyros, called Dibapha [Murex based dye]: and a man could not buy a pound of it for a thousand deniers” (Pliny, *Natural History*, Book 9, ch. 39).