

Has Tekhelet been Found?

By: MENACHEM EPSTEIN

While thousands of Jews around the world have recently begun adding what they are convinced is *tekhelet* to their *tzitzit*, a recent article published in Flatbush and distributed throughout America (*Halacha Berurah* vol. 9, issue 2, “The Search for Techeiles”^o) claims that no one “has presented any concrete proof that the murex *techeiles* is genuine,” and “that there are clear indicators that neither the *chilazon* nor *techeiles* have any connection to the murex *techeiles*.” In this article, the author demonstrates why these statements are entirely baseless.

The possibility of the murex snail being the *hillazon* of *tekhelet* has been under consideration for a considerable amount of time. Until recently almost all rabbis rejected this possibility out of hand simply because the dye of the murex is purple. From our tradition we know without a doubt that *tekhelet* is blue.¹ In 1983 a startling discovery was

^o *Halacha Berurah* is published by Tzeirei Agudas Yisroel. Following the title of the referenced article it states, “Reviewed by Horav Shlomo Miller,” and at the end of the article it states, “*Halacha Berurah* is deeply grateful to Dr. Mendel Singer PhD, School of Medicine, Cleveland, Ohio and Dr. Yoel (Jonathan) Ostroff, Department of Computer Science and Engineering, York University, Toronto, Canada for reviewing this article.”

¹ Rav Herzog in his doctoral thesis written in 1913 suggested that the murex would be the most likely candidate, if not for the fact that it produced a purple dye. This manuscript was later edited and published as “The Royal Purple and the Biblical Blue” by Keter 1987. Almost all scholars today agree that *tekhelet* is blue. The Septuagint translation of the Torah translates *tekhelet* as *iakanthos*, which is a blue flower. At that time *tekhelet* was still being used. Professor I. Zeiderman presents a paper in *Tehumin* vol. 9 arguing that *tekhelet* is purple with a bluish shade.

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made. When the dyeing process of the murex trunculus was performed outdoors, the resulting color of the dye was blue.² This discovery opened the door to performing the *mitzvah* of *במלואו זָיִזִית*.

The first part of this presentation will focus on the arguments that support the claim that the murex snail is the renowned *hillazon* from which *tekehelet* was produced. The second part will present the arguments against this claim—and we will refute them.³

Evidence that the Murex Trunculus is the *Hillazon*

The main reason for believing that the murex trunculus is the *hillazon* is the characteristics of the dye produced from it, particularly its color. *Hazal* (*Menahot* 42b–43a) state that there is an exact look-alike for *tekehelet*—a plant called *kela ilan*. The consensus today, based on

However, he also agrees that the murex was the snail used for *tekehelet*. Rabbi Yehuda Rok of Yeshiva Har Etzion in the article *חידוש התכלת ועניני ציצית*, published in *Techumin* vol. 16, brings many proofs that *tekehelet* is blue. See also note 4, that many *risbonim* identify *kela ilan* with indigo. See also *The Renaissance of a Mitzvah*, YU Press: January 1997.

² Thus it is possible to produce both purple and blue dyes from the same snail. The ancients also knew this. See *Vitruvius De Architectura* (ed. H.L. Jones), Cambridge: Loeb Classical Library, 1930, Book VII, c. VII-XIV, pp. 113–129: “For it does not yield the same color everywhere, but it is modified naturally by the course of the sun. As we proceed between the north and south it becomes a leaden blue.” There were a number of Roman Imperial decrees restricting the use of murex dyes to the nobility (see appendix). We can now understand the Roman decree against wearing *tekehelet* mentioned in the *gemara* (סנהדרין י"ב) not as an anti-religious decree, but because *tekehelet* was produced from the same murex snail as the royal purple dye. Because the snail was becoming extinct (See paper by Susan C. Druding at Seminar presented in Seattle Washington at Convergence 1982 titled “Dye History from 2600 BC to the 20th Century”), the Romans decreed not to wear anything made from the murex. Without this explanation, one would have said that the Romans made their decree against *tekehelet* out of pure anti-Semitism without having any understanding as to why they chose this particular mitzvah.

³ Interleaved with these arguments will be a response to the article in *Halacha Berurah* vol. 9, issue 2, “The Search for *Tekehelet*.”

many *rishonim*,⁴ is that the dye produced from the *kela ilan* plant was indigo. The *gemara* states clearly that the color of *tekehelet* is virtually indistinguishable from *kela ilan*. Since the dye produced from *murex trunculus* is exactly the same color as the indigo made from plants,⁵ it is clear that the color of its dye is the true *tekehelet* color. However, there is a *Tosefta*⁶ that states that *tekehelet* not produced from the *hillazon* is *pasul*, invalid. Thus we must also show that the *murex trunculus* is the *hillazon* of *Hazal*.⁷

Hazal (*Shabbat* 26a) state that the location where the *hillazon* is known to be found is between Tzur and Haifa. Additionally, the area is identified as belonging to *Shevet Zevulun*.⁸ The *murex* is indeed found in that area. In fact, hundreds of yards of *murex* shells have been found there,⁹ an indication that it was the site of an ancient dye-

⁴ נמוקי יוסף ב"מ דף לד בדפי ריף, ערוך קלא אילן - פירוש אינדיקו, רמב"ם פירוש המשנה כלאים ב'ה, שו"ת גאונים מן הגניזה, מדרש הגדול מתימן.

⁵ Actually, the molecule that acts as the coloring agent in both indigo (the plant) and the *murex* (snail) is identical. See *Tekhelet* by Baruch Sterman, which describes in detail the chemistry involved in producing the purple dye (dibromide indigo) and the indigo dye.

⁶ תוספתא מנחות ט:ו: תכלת אין כשרה אלא מן החלזון; שלא מן החלזון פסולה. שני התולעת מן התולעת שבהרים הביא; שלא מן התולעת שבהרים פסולה.

⁷ There is a possibility that the term *hillazon* here refers not to a specific species but to a generic term for any snail. See footnote 24. If so, even if the *hillazon* of the *tekehelet* in the *Talmud* does not refer to the *murex*, it would still be usable for *zizit*. The *Tiferet Yisrael* (*Hakedamah to Seder Mo'ed*, pp. 15b–16a) and others go so far as to suggest that any dye of the proper color and steadfastness can be used for *zizit*.

⁸ רשי דברים לג:ט.

⁹ J. Wilfrid Jackson, F.G.S. in an article entitled "The Geographical Distribution of the Shell-Purple Industry," vol. 60, part II of *Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, session 1915–1916, writes that archeologist L. Lortet reported (*La Syrie d'aujourd'hui*, Paris 1883 page 102) finding in the vicinity of Sidon great banks, a hundred yards long and several yards thick, composed of broken shells of *murex trunculus*. H. B. Tristram (*The land of Israel*, 1882, p. 48) reports that large quantities of crushed *murex Brandaris* shells were discovered in Tyre. The article reported a finding of large quantities of *murex Brandaris* shells that give off a reddish purple dye. In a separate area were found large quantities of *murex trunculus* shells that give off

ing factory.¹⁰ Another characteristic known from *Hazal* is the steadfastness of the dye. Both the *gemara* (*Menahot* 43a) and *Rambam* (*Hilkhot Zizit* 2:1) mention that it is a dye that does not lose its color. The *gemara* distinguishes *tebbelet* from *kela ilan* because the *tebbelet* dye does not fade. The murex trunculus *tebbelet* has been tested by independent fabric inspectors at the Shenkar College of Fibers and received excellent marks for fastness (see footnote 15).

The ability to produce a dye from a specific living creature is rare.¹¹ It would be a highly unlikely coincidence for there to be in existence two separate dyes of the exact same color produced from two different sea animals in the same area. Thus it is highly probable that the murex is the true *hillazon*.¹²

In addition, we do not find in *Hazal* any mention of a *pasul* source of *tebbelet* besides *kela ilan*. Since the skill of producing a blue dye from the murex snail was known in their time, *Hazal*¹³ would

the bluish purple dye. Scientists thought this was for *tebbelet*, but our tradition says it was blue.

¹⁰ The purple and blue dyes produced from the murex snails were a prized material and were not used exclusively for *zizit*.

¹¹ See www.ancientroute.com/resource/cloth/dye.htm for a list of ancient dyes. Of the less than 10 listed, only one was from a sea animal (murex). Another was from an insect, and all others were from either a plant or a mineral. See Rabbi Twersky (footnote 30), “*Encyclopedia Britannica*, entry “Dyestuffs and Pigments,” which mentions 10 to 12 materials in use prior to the 19th century.

¹² This argument is convincing from a logical perspective, and it also has a halakhic aspect. In halakhah, identification of an object can be made through סימנים. They can be used to identify lost objects or a deceased husband. An object that has a סימן מובהק ביותר is considered a good סימן (מן התורה (שלחן ערוך אבן העזר סימן י"ז סעיף כד). A סימן המובהק ביותר is defined as a feature found in less than one in a thousand of the general objects (באר היטב אבן העזר סימן י"ז ס"ק עד). Of the thousands of fish and mollusks that were studied to date, no other fish has been found that can produce the *tebbelet* color. Seeing that the ability to procure a *tebbelet* dye from a given fish is an occurrence of one in many thousands, we can consider this property as a סימן מובהק ביותר that identifies the murex snail as the true *hillazon*.

¹³ See footnote 2.

have told us explicitly that the murex is *pasul*¹⁴ if a different animal were the real source of *tekelet*.

The second argument for the authenticity of the murex is from the *gemara's* statement (*Shabbat* 75a) that the *hillazon* must be kept alive while the blood is extracted in order for the dye to turn out right. A similar property has been discovered in the murex. In experiments performed thereon, the quality of the dye severely degraded within two hours after death. The enzyme required for the formation of the dye quickly decomposes upon the death of the snail, and so the dye precursor must be extracted while the snail is alive or soon after death.¹⁵ In the article written for the *Halacha Berurah* (see footnote 3), the argument is made that from this *Gemara* "it is clearly implied that the dye begins to degrade at the moment of death." This may be true, but both Pliny's and Aristotle's descriptions¹⁶ of the murex state that the dye must be obtained from live snails. It is clear the ancients believed (and maybe correctly so, given how they extracted the dye) that the murex must be kept alive during extraction!

The third argument is from literary sources that identify the *hillazon*. *Ravya* on *Berakhot*¹⁷ quotes a Yerushalmi in that *masekhta* as follows: בין תכלת לכרתי, בין פורפורין ובין פריפינין. *Ravya* then comments: והוא מעיל שקורין בלע"ז פורפירא. The simplest understanding of this Yerushalmi is that it is giving two practical examples of items, one that has the color תכלת, and the other with the color כרתי. Based on the explanation of *Ravya*, the *Gemara* is saying a commonly used garment called פורפורין bore the color of *tekelet* that is mentioned in the *Mishnah*, while פריפינין was the color of כרתי. Thus the Yerushalmi identifies *tekelet* with פורפורין. Since *purpura* is a Greek word that

¹⁴ In *Hazal* point out that the *צפצפה* is *pasul*, and there are additional cases where *Hazal* point out the *pesul* of other objects.

¹⁵ Article by Baruch Serman titled "A response to Dr. Singer's Review of murex trunculus as the Source of Techelet."

¹⁶ Pliny the Elder *Natural History* Book p. IX and pp. 40–45. Aristotle in *Des Animilibus Historia* describes the Phoenician dyeing process of the purple dye in detail

¹⁷ ראביה ברכות כה הירושלמי שלנו יש גירסא אחרת בין תכלת לכרתי בין פורפירין ובין פריפינין והוא מעיל שקורין בלשון לעז פורפירא ויש שדומה לו קצת

means either the murex snail or the color purple that comes from it, we have clear evidence of a link between the murex and the color *tekebelet*. The article in *Halacha Berurah* differs, claiming that “the supporters have purportedly misinterpreted a *Yerushalmi* quoted by the Ravva.” Although admitting that פורפירין in the *Yerushalmi* refers to the murex snail, the article holds that the terms פורפורין and פריפינין are not giving examples of cloths colored with תכלת and כרתי, but are rather another comparison of two pieces of clothing with totally different colors. He does not explain what prompts him to change the simple explanation but just states, "המעייין היטב יבין האמת". That this new comparison should just happen to be with a material produced from the murex, which can also be a source of the color of *tekebelet*, would be a coincidence of major proportions, however. In addition, the *Musaf Arukh* translates the word פרפר as בגד תכלת.

There are many additional sources indicating that the *hillazon* used for dyeing *tekebelet* is the purpur snail. The *Havot Ya'ir* of the 17th century states that *tekebelet* is a purple dye that comes from the purpur.¹⁸ The *Halacha Berurah* article argues that “the *Havot Ya'ir*, who was under the impression that *tekebelet* was purple, came to this conclusion on his own.” Precisely so—the *Havot Ya'ir* was so convinced that *tekebelet* was made from the murex, he was willing to contemplate that *tekebelet* was purple despite the fact that this conclusion went against our tradition! Clearly he felt that the evidence in favor of the purpura was overwhelming. (Other rabbis could not accept this rejection of tradition despite the evidence and thus declared that purpura could not be the source of *tekebelet*.) The recent discovery of the possibility of extracting blue dye from the purpura completely resolved this contradiction between the evidence and tradition.

Rav Avraham Harophe, who also lived in the 17th century, states explicitly that the purpura is the *hillazon* of *tekebelet*.¹⁹ The *Halacha Berurah* article claims that “Passing *halachic* rulings based on *keitvei ha-yad* discovered long after the author has lived is itself quite dubious

¹⁸ חוות יאיר מקור חיים יח:ב: בהידושים כתבתי דם חלזון שבו צובעין תכלת אינו בלוא רק צבע פורפור שנעשה מדם דג שנקרא הדג פורפור עיין ספר לולאות התכלת דף 1

¹⁹ הרב אברהם הרופא פורטאליאוני שנת שעב בספר שלו על כל עניני מקדש פרק כט: והמלה הזאת בלאטה יש לה שתי משמעויות כפי הפרש הלשונית, כי בלשון לאטינו רוצה לומר עש האוכל הבגדו; בלשון יון רוצה לומר רמש הים הנקרא פורפורא והוא החלזון שצובעים בו התכלת עיין בספר לולאות תכלת דף 100

in the eyes of the *poskim*, as the authenticity and integrity of each word is questionable.” This generalization is unwarranted. The *Hazon Ish*—brought as support to this statement in the footnotes—is discussing only whether, because of newly found *kitvei yad*, one can change examined and accepted texts that have been used for many years. He is saying that, because the newly found text might be corrupt and was therefore rejected by previous generations, we do not change our established text that was passed down through *gedolei olam*. All this is obviously irrelevant to our case, where we have no previous text! In our case the known evidence is consistent with the *pesak* in the *ketav yad*, so why should we question its authenticity?²⁰

Rav Tevger in his book *K'lil Tekhelet*²¹ argues that marine biologists have continually searched the Mediterranean Sea for new species of all types of mollusks, and none have been discovered for many tens of years. The likelihood of a new mollusk being discovered is extremely low. Given that the murex trunculus conforms to all these characteristics, it is almost certain that we have found the right one.

Arguments against the Murex being the *Hillazon*

1. The strongest argument raised against the murex’s being the *hillazon* is that the *gemara* (*Menahot* 42b) describes a test to distinguish

²⁰ One could have possibly brought a different proof from the first letter of the *Hazon Ish* in א הלכות כלאים סימן 8 where he says that new *kitvei ha-yad* should not be used to change the minority to a majority opinion. In that letter, however, he does not question the authenticity of the *kitvei yad*, but rather mitigates the importance of a technical majority of *poskim* for a number of reasons. First, there is no halakhah of רוב outside of *beit din*. Thus, each community uses its particular *poskim* even when they are the minority. The known major *poskim* are considered the *Rabbanim muvhakim* of *Klal Yisrael* and thus their opinions carry more weight than others even when they are a minority. Also, the personal logic of the present day *Posek* carries weight in deciding which opinion to follow. Second, it is impossible today to determine the real majority opinion of previous generations, simply because not all *poskim* wrote their opinions in books and not all books survived.

²¹ E. Tevger, *Kelil Tekhelet*, Jerusalem: Chemed Press, 1993.

between the *tebbelet* produced by the *hillazon* and the *tebbelet* produced by קלא אילן. If placed in a certain combination of substances, the קלא אילן dye would be ruined while the *tebbelet* would remain intact. The problem is that both the indigo plant and the murex snail produce the same indigo molecule as the basis of their dyes. How could they react differently to *Hazal's* test? This problem bothered the original *Talmidei Hakhamim* who worked with the murex. Rav Tevger discussed the issue with Professor Elsner, an expert on dyeing textiles, who stated that although the coloring agents of the dyes are identical, there are differences in the makeup of the accompanying substances. In other words, the fastness of a dye is affected not only by the molecule that attaches to the fabric and gives it a new color but also by the accompanying substances that assist in that molecule's attaching, i.e., the reduction process.²² The *Halacha Berurah* article claims that "it is highly unreasonable that *Hazal* would make a test that was based on impurities, as the test will vary from batch to batch." But we are discussing not impurities but differences in the dyeing material, albeit differences that do not affect the color.

2. The *Gemara* says the *hillazon* is a גז. Is a snail a גז? There are several proofs from *Hazal* that the *hillazon* is not a fish but some sort of mollusk, and most probably a snail. Firstly, the midrash says the

²² Rabbi Twersky quotes a correspondence from Baruch Serman (footnote 30): "Though we are not one hundred percent certain, it would appear that snail *tebbelet* and indigo were reduced in different ways. *Tebbelet*, since it comes from a snail, may have been reduced chemically using lead and tin pots with the sulfuric reducing agent found in the glands of the snails. (This seems to be what Pliny describes.) Indigo, on the other hand, comes up from a plant and has no proteins or sulfur compounds. Up until a few years ago in America, and still in some African countries, indigo is reduced by fermentation, using bran, madder and sugars to cultivate the bacteria necessary to reduce the dye. These differences may have had something to do with either the way the dye adhered to the wool, or perhaps some extraneous chemicals found in the dyed wool (maybe in the snail *tebbelet*, or just possibly in the plant indigo)." Baruch Serman quotes Nobel Chemist Professor Roald Hoffman, who sees as plausible the proposition that the steadfastness of the two dyes may be different depending on the method of extraction (footnote 15).

shell of the *hillaẓon* grows with it.²³ If it has a shell then it is a mollusk of some sort. Secondly, the word *hillaẓon* normally means snail.²⁴ Thirdly, the Ran²⁵ says the *hillaẓon* used for *tekebelet* has a גוף אטום with no bones and is a slow-moving sea creature. The *Ritvah*²⁶ and his *Rebbe* (presumably the *Ra'ab*) describe the *hillaẓon* in the same terms as those of the *Ran*. This means the *hillaẓon* is a snail. Therefore, since the *hillaẓon* is referred to as a גג, we see that all these *Rishonim* held that a snail is a גג. For more proofs that the snail is considered a fish in other areas of *halakhab*, see footnote 15.

3. The *Gemara* (*Shabbat* 75a) states clearly that it is considered צידה to capture a *hillaẓon*. The question arises, how can there be צידה on an animal like a snail that can be taken אחת? בשחיה אחת?²⁷ Rav Shlomo Fisher uses this argument to dismiss the murex *tekebelet*.²⁸ Yet the four major *Rishonim* just quoted above must hold that by capturing a slow-moving mollusk one can be חייב משום צד. We find in Rashi²⁹ that צידה is any process where tricks or special strategies are needed to catch an animal. The murex snail burrows itself into the sand at times, and even people using scuba diving equipment have a very hard time catching this snail since it blends in with the background. In fact, fishermen today use nets with traps to catch it. These *rishonim* hold that when you need tricks to trap the animal it is not considered בשחיה אחת.

4. The *Gemara* (*Menahot* 44a) describes the *hillaẓon* as גופו דומה לים. The color of the murex shell, however, is not the color of the sea. So how can it be the true *hillaẓon*? The supporters explain that

²³ פסיקתא דרב כהנא יא:כא אמר להם חלזון הזה כל זמן שהוא גדל עמו נרתיק גדל עמו

²⁴ ערוך השלם "חלזון של משנה—והוא שם כולל למיני שבלול וחומט ובעל נרתיק הגדל בים (והוא מדבר על חלזון של תכלת). רשי, ע"ז כח עמוד ב ד"ה משקדי חלזוני: לימע"ץ בלע"ז, לולאות תכלת של חלזון של תכלת). וכן חזקוני ויקרא יא:ל חמט—לימצין בלע"ז דף 88–100.

²⁵ חידושי רן שבת קז.

²⁶ חידושי ריטבא הוצאת מוסד הרב קוק דף עה.

²⁷ רמבם הלכות שבת י:כ.

²⁸ Heard from him personally in a private conversation.

²⁹ רשי ביצה כד.

the color of the *hillazon* is the same as the color of the seabed upon which it lies when living in the ocean.³⁰ Only after being taken out of the ocean and drying out do the shells turn a whitish color. The different color of the snail while still in the ocean is probably due to algae that attach to its shell when the snail is alive. This provides it with a perfect camouflage. The *Halacha Berurah* article states that “even if one were to argue that it can also refer to the shell since this is what first meets a person’s eye, it is unreasonable to extend this untenable idea to also include foreign organisms such as algae that become attached to it. *Hazal* would not refer to it as *guf*, but would have been more descriptive.” First of all, any scientist or layman would definitely consider a shell that grows with the snail to be part of its body. Calling this position “untenable” is completely unwarranted. With regard to the algae that attach to the shell, it must be understood that they are firmly imbedded therein and cannot be easily washed or scraped off. Rashi defines “*guf*” as *מראה גופו*, the “look” of its body. Even if we view the algae as not being a part of the snail’s body, we can still say that the murex looks like the sea due to the algae attached to it. Any observer of a live *hillazon* would say that the color of its shell is blue-green.

5. The *Gemara* (*Menahot* 44a) relates that the *hillazon* comes up out of the sea once every 70 years. This phenomenon has not been observed by the murex snail, so how can it be the *hillazon* of *Hazal*?³¹ First of all, it is clear from the *Gemara* (*Shabbat* 75a) that in addition to coming out of the sea every seventy years, the *hillazon* was also hunted with normal methods at other times. Plus, there are those who say that the coming out once every 70 years was a supernatural occurrence.³² If so, it is reasonable that *בזמן הזה* this miracle does not occur. In fact, the Radvaz³³ explains that this phenomenon occurred only during the time of the first *Beit ha-Mikdash*. At the time of the exile this special occurrence stopped, and from that point on the *hillazon* was trapped only with normal methods. Alternately, if we un-

³⁰ Rabbi Chaim Twersky, “Identifying the Chilazon,” *Journal of Halacha and Contemporary Society*, NUM XXXIV, fall 1997.

³¹ See Rav Herzog, *The Royal Purple* p. 69.

³² חידה פתח עינים מנחות מד.

³³ שו"ת רדב"ז סימן תרפ"ה.

derstand the coming out of the *hillazon* to be a natural event,³⁴ then it is possible that changes in ocean conditions and/or the drastic reduction in the quantity of the murex snails in their habitat³⁵ caused this event to cease.

Reinstating a Mitzvah

The *Midrash Tanhuma* relates that the *tekhelet* was נגנו.³⁶ Is it possible to reinstate a mitzvah that was נגנו?³⁷ Radvaz³⁸ and Maharil³⁹ both say that *tekhelet* is theoretically available and one need only identify and find the *hillazon* in order to reinstate *tekhelet*.⁴⁰ Additionally, the Raavad⁴¹ records exactly how Rav Natrunai Gaon would tie his *tekhelet*. Rav Natrunai is clearly referring to something actually performed in his day since he says about a particular detail ונהג לעשותו. Therefore, we know that *tekhelet* was extant at around 850 CE, or 100 years after the *Tanhuma* was completed. Exactly what the word נגנו means is now unclear, since *tekhelet* was extant after that time.

Wearing *Tekhelet* as a *Safek*

Assuming that murex *tekhelet* has the status of *safek*, there is a question whether or not the rule of ספק דאורייתא לחומרא applies. The *Halachah Berurah* article states that “Quite a number of poskim maintain

³⁴ The Radzhiner Rebbe and Rav Herzog have suggested that 70 years is not meant as a precise number, but rather means that the *hillazon* would come out of the sea at infrequent intervals.

³⁵ The murex snail is currently considered an endangered species in Israel.

³⁶ מדרש תנחומא במדבר רבה פרשת שלח יז

³⁷ This question has been an issue ever since the Radziner Rebbe started looking for the lost *hillazon*. For a full discussion see *Lulaot Hatheles* pp. 19–35.

³⁸ שו"ת רדב"ז תשובה תרפה.

³⁹ שו"ת מהרי"ל החדשה מכון ירושלים 2:5.

⁴⁰ These two *Poskim* clearly disagree with the opinion (said in the name of the *Beit ha-Levi*) that even if we knew what the *hillazon* is, we would not be able to use it because of the lack of *Masorah*.

⁴¹ ראבד על הרמבם הלכות ציצית פרק א:ז.

that there is no requirement to perform a *mitzvah* with an item regarding which there is a doubt whether one can fulfill a mitzvah with it.” However, the Ran⁴² says that if one has not done the *mitzvah* of *lulav* and it is *bein hashmoshos*, one should do it without saying a *bracha* since it is a ספק. Rav Shlomo Miller⁴³ in a previous article addresses this point with the following argument:

במצוה שמחייב בתורת ודאי ויש לפניו אופן לקיימו מספק ואחר
שיקיים מספק עדיין נשאר מחוייב בדבר סד"א לחומרא א"כ
ליכא חיוב מה"ת לעשות דבר שאף אחר עשייתו נשאר החיוב
לעשות מוטל עליו ואינו דומה כלל לדברי הרן דבבהש"מ יש
חיוב מספק וע"י עשייתו הוא פוטר עצמו מן החיוב ולא נשאר
שום חיוב עליו.

I disagree on several counts. Firstly, even if you accept the distinction made by Rabbi Miller, in the case of murex *tekehelet* we have done as much as possible to perform the *mitzvah* because there is no better candidate for *tekehelet* that we know of. Thus, after tying murex *tekehelet* no חיוב remains. Secondly, the *Mishnah Berurah*⁴⁴ cites a *Pri Megadim* that if one has *tefillin* that have fallen in water, there is a *safek* whether he can accomplish the *mitzvah*, and he should put them on without a *brakhab*. This is exactly an analogous case to the murex, and still the *Pri Megadim* and *Mishnah Berurah* say to perform the *mitzvah*—even though there is a *safek*! Lastly, his distinction is made without any proof from a primary source. The *aḥaronim* bring down the Ran without making any distinctions.

Two additional reasons are given by the *Halacha Berurah* article for not wearing murex *tekehelet*. A) For kabbalistic reasons one should not wear *tekehelet* made from indigo.⁴⁵ B) “*Halacha* mandates that *lekhathilah*, unless genuine *tekehelet* is being used, *zizis* should be

⁴² מובא בב"י א"ח ס' תרס"ה מ"א ס' תרנב משנה ברורה שם ס"ק ב (ושאר אחרונים).

⁴³ מכתב מרוב מילר לד"ר זינגר יום ב' לפרשת ויחי תשס"ד על דעתו במורקס לגבי תכלת.

⁴⁴ א"ח ס' ל"ט משנה ברורה ס"ק כו.

⁴⁵ The article presumes that *tekehelet* made from the murex has the same status of *kela ilan* as far as Kabbalah is concerned. This assumption is arguable. In general, the role of Kabbalah in halakhah needs its own discussion, which is beyond the scope of this article.

the same color as the garment.”⁴⁶ Clearly, both of these reasons apply only if we are convinced that murex *tekhelet* is not authentic. If we consider murex *tekhelet* to have a good chance of being genuine, then the possibility of fulfilling this great *mitzvah* overrides these considerations.

Summary

A sea creature has been found with many of the critical characteristics of the *hillazon* recorded by *Hilazon*. It is found in the proper location, it matches the *hillazon* linguistically, and it produces the proper color. We know of no other animal of which we can make the same claim. ❧

⁴⁶ This statement is itself questionable. The רמא in ה טעיף ה actually writes that one should wear white *zizit* even if the garment is colored.

APPENDIX

An approximate timeline is outlined below so that the reader may get some perspective as to when some of the main events occurred. Most of the following information has been taken from the Timeline on the www.tekhelet.com site.

Date	Event
1750 BCE (circa Avraham's lifetime)	Archaeological evidence now available suggests the origins of the purple-and-blue-dyeing industry can be traced to Crete. This implies that <i>tekhelet</i> was well-known at the time the Torah was given.
1200 BCE (Jews entering מ"א)	Chemical analysis of an ancient vat at Tel Shikmona proves to be molecularly equivalent to dye from murex snails.
1200–900 BCE	Vat from Tel Shikmona, as well as other archaeological finds at numerous sites, reveals an advanced dye industry using murex snails on the Canaanite coast.
100 BCE–68 CE (End of 2 nd Temple)	Caesar (100–44 BCE) and Augustus (63 BCE–14 CE) restrict the use of dyes to governing classes. Nero (37–68 CE) issues a decree giving the emperor the exclusive right to wear purple or blue garments.
300 CE	Under Constantius (337–362), restrictions on use of <i>tekhelet</i> are strictly enforced. Edicts by Gratian, Valentinian & Theodosius make the manufacture of higher-quality purple and blue a state monopoly.
500 CE (End of Talmud)	The Talmud tells of <i>tekhelet</i> being brought from Israel to Babylon in the days of Rav Achai (506). No reference to its discontinuance mentioned in Talmud.
639 CE	Arab conquest of Israel is suggested to have brought an end to the snail-source dyeing there.

Date	Event
750 CE	<i>Midrash Tanhuma</i> , 750, laments, “and now we no longer have <i>tekbelet</i> , only white.”
850 CE	Rav Natrunai <i>gaon</i> writes how he tied his <i>tekbelet</i> onto his <i>zizit</i> . This description is recorded by the Raavad.
1500 CE	Rondelet Guillau (d. 1566) is the first to identify Pliny’s <i>purpura</i> with the species <i>murex brandaris</i> . Fabius Columna (1616) suggests that <i>murex trunculus</i> was utilized in the ancient dyeing process. William Cole (1681) notes a colorless fluid in the hypobranchial gland of mollusks (<i>purpura lapillus</i>) found off the coast of Britain that converts to a red color upon exposure to light, thus revealing the sensitivity of mollusk-based dye to light.
1857 CE	French zoologist Henri de Leaze-Duthiers discovers three dye-producing snails in the Mediterranean: <i>murex brandaris</i> , <i>murex trunculus</i> , and <i>thais haemastoma</i> .
1864	At Sidon are found shells of the <i>murex trunculus</i> snail that fill an area hundreds of yards long and several yards deep. The shells are broken at the spot that gives access to the glands from which the dyestuff is obtained. At some distance a separate and distinct massive mound of <i>murex brandaris</i> and <i>thais haemastoma</i> is found. Since a reddish-purple dye is most readily obtainable from the <i>murex brandaris</i> and <i>thais haemastoma</i> , as opposed to the bluish-purple obtained from the <i>murex trunculus</i> , Egyptologist A. Dedekind (1898) viewed this as undeniable proof that the <i>murex trunculus</i> was the snail used for <i>tekbelet</i> and the others for <i>argamon</i> (purple or reddish purple). Rav Herzog concurred.

Date	Event
1888	Rabbi Gershon Henoch Leiner pioneers a quest for <i>tekhelet</i> which led to the isolation of a certain type of squid as its source. Subsequent analysis of the dye, however, reveals the source of the blue color to be not the squid but ingredients added to the dye. Rabbi Leiner did the pioneering work on <i>tekhelet</i> on which all subsequent investigation has been based.
1919	German scientist Paul Friedlander identifies the chemical structure of the purple dye from the murex snail as dibromide indigo.
1983	Professor Otto Elsner from the Shenker College of Fibers in Israel and Ehud Spanier of Haifa University discover the secret of producing a pure blue color (indigo).