

Arguments in favour of *Ra'avad's* method of tying *tzitzit*

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Introduction

For nearly three decades, thanks to the research of Professor Otto Elsner and the efforts of Rabbi Eliyahu Tavger and the P'til Tekhelet institute, Jews have been able to dye produced from the *murex trunculus*¹ snail in order to fulfil the biblical commandment of wearing *tzitzit* with strings of *tekhelet*. Despite the unambiguous nature of this command and its seemingly inoffensive, almost mundane, nature, *tekhelet* has proved to be an enormously controversial issue. A simple blue string turns out to be the proverbial can of worms or hornets' nest: any penetrating discussion on whether to wear *tekhelet* will inevitably touch on certain issues that are generally kept below the surface in order to preserve the fragile unity of orthodoxy. These include the validity of scientific and historical evidence in halakhic decision-making, the authority and authorship of the *Zohar*, what credence to give certain statements made by historical figures '*al pi kabbala*', the authority of those Rabbis identified as *gedolei hador*, the role of tradition or *mesorah* in determining halakhic practice, and the significance, or lack of it, of the return of the Jewish people to the land of Israel. This article will make no further contribution to the debate except to observe that the proponents of *tekhelet* have generally been loath to openly acknowledge the hashkafic issues that lie behind the halakhic decision of whether to wear *tekhelet*, preferring to focus on the evidence that the *murex trunculus* is indeed the *hilazon* referred to by *Hazal*, whereas their opponents have shown no such scruples and, further, have proudly turned their non-fulfilment of this *mitzvah* into one of the sadly numerous marks of sectarian identification that plague the Jewish world.

For those who accept that *tekhelet* has been rediscovered and that it is correct to wear it, another issue presents itself, which, whilst provoking less animosity, touches on another fundamental hashkafic question that most orthodox Jews probably regard as settled, or non-existent, namely what is the correct halakhic method. The *Shulhan Arukh* has nothing to say about what proportion of the four strings that make up each *tzitzit* should be blue and white respectively. However, the overwhelming majority of *Rishonim* follow *Rashi* in stating that there should be two each of blue and white and, from various incidental remarks, we can see that this is the opinion of the most prominent *Aharonim*, including the *Mishnah Berurah*. According to the dominant halakhic paradigm, it seems obvious that this should be the *halakha*. On the other hand, there is no source from *Hazal* that clearly supports this opinion and the only unambiguous source we have states that one string should be blue and the

¹The snail is more commonly by marine biologists as the *Hexaplex Trunculus*. However, I will stick with the name that is better known in Jewish circles to avoid any more unnecessary confusion about the correct identity of the *hilazon*.

remaining three white.² According to the sort of halakhic method described in *Rambam's* introduction to the *Mishne Torah*, in which the *posek's* task is to assess all the sources from the *tannaim* and *amoraim*, using later sources as guides, but not as authorities, this would appear to be the correct practice. It is this author's opinion that the very decision to wear *tekhelet* amounts to a rejection of the dominant halakhic paradigm which is incapable of accommodating it; this perhaps explains why one string is the overwhelmingly popular option despite the weight of contemporary Rabbinic opinion being in favour of two.³ An added twist is provided by the fact that *Rambam* himself, following R. Shmuel ben Ḥafni, ruled that only half a string should be blue (resulting in one out of eight once they are inserted into the garment).⁴

There is yet one more issue that has attracted much less attention and probably does not have the capacity to generate the same degree of controversy. Once we have decided how many *tekhelet* strings to include in our *tzitzit*, how should we go about tying them? The question hinges on a few lines in the *Talmud Bavli*, which can be interpreted in different ways. As we shall soon see, the normative practice of wrapping one string seven, eight, eleven and thirteen (or 10, 5, 6, 5) times between five knots conforms, on the face of it, to none of these interpretations. Accordingly, the P'til Tekhelet institute gives advice on nine different possible methods of tying.⁵ In this article I will defend the method recorded by *Ra'avad*, citing a non-extant *t'shuva* of Natronai Gaon. This is not intended to act as a substitute for the advice of a competent halakhic authority; my intention is simply to publicise two arguments in favour of this method that, to my knowledge, are not widely appreciated. Beforehand, however, it is necessary to review the alternatives, which entails a look at sources upon which they are based.

The Sources

The first fact that everyone knows about tying *tzitzit* is that they must have five knots. The five knots plus eight strings added to six hundred (the *gematria* value of ציצית) makes 613, thus fulfilling the scriptural command to remember all the *mitzvot* through *tzitzit*. *Rashi* includes this idea in his commentary on the words וראיתם אותו and also mentions it in his commentary

² *Pisqa* 115

מכמה גדילים אתה עושה אין פחות משלשה דברי בית הלל, בית שמאי אומרים שלשה של צנר ורביעית של תכלת והלכה כדברי בית שמאי.

In most editions of *Sifrei Devarim* 236 we find the following passage:

כמה גדילים נעשים אין פחות משלשה חוטין כדברי בית הלל בית שמאי אומרים מארבעה חוטים של תכלת וארבעה חוטים של לבן

This would apparently mean one should wear eight strings if, as in *Sifrei Bemidbar* and B *Menahot* 41b, the *halakha* follows *Beit Shammai*. The *Vilna Gaon* suggested that this passage should be amended to mean the equivalent of the passage in *Sifrei Bemidbar*, but Louis Finkelstein argued that the text we have accurately reflects an earlier *halakha*.

³ A less charitable explanation that some have offered is that wearing only one string halves the cost.

⁴ See *Mishne Tora, Hikkhot Tzitzit*, 1:6; *Sh'elot u'T'shuvoth Rabeinu Moshe Ben Maimon: Pe'er haDor* (Jerusalem, 1993/4) 21, pp. 63-4.

⁵ <https://www.tekhelet.com/tying/>

on the *Gemara*.⁶ There is, however, is no source from the era of *Hazal* that records such a practice. The first work to ascribe significance to the practice of tying five knots in *tzitzit* is *Midrash Tanhuma* and it is almost certainly significant that this is also where we find the earliest testimony to the fact that *tekhelet* is no longer available.⁷ As *Ramban* explains, the phrase 'and you shall see it and you shall remember' cannot originally refer to this numerical idea for a number of reasons, but most likely refers to the *tekhelet* string itself.⁸ It is probable that the numerological concept evolved as a way of investing *tzitzit* with some of the significance that was lost with the disappearance of *tekhelet*.

In fact, the *Gemara* specifies only that the *Kesher Elyon*, or upper knot, is *d'orayta*.⁹ This may refer either to the knot closest to the garment (*Tosefot*), or the one farthest away (*Rashi*). In addition, the *Gemara* concludes that one has the option of putting a knot in between every section of wrapped string or *hulya* (literally vertebra). This, as will become apparent, allows for a great deal of latitude in how many knots to include. It should also be mentioned here that the modern practice of using an obtrusive double knot, as required by *Rabbeinu Tam*, is not endorsed by the *Ge'onim* and is not necessarily intended by the *Gemara*.

The rest of what the *Gemara* has to say on the subject may surprise the ordinary *tzitzit* wearer:

וכמה שיוער חוליא תניא רבי אומר כדי שיכרוכ וישנה וישלש ת(א)נא הפוחת לא יפחות משבע והמוסיף
לא יוסוף על שלש עשרה הפוחת לא יפחות משבע כנגד שבע רקיעים והמוסיף לא יוסוף על שלש
עשרה כנגד שבע רקיעין וששה אורין שביניהם תנא כשהוא מתחיל מתחיל בלבן כנף מין כנף וכשהוא
מסיים מסיים בלבן מעלין בקדש ולא מורידין

And what is the measurement of a *hulya*? It is taught, Rabi would say: he should wind and repeat and do a third time. It is taught, one who diminishes should not do less than seven and one who increases should not do more than thirteen. Seven corresponds to the seven heavens; thirteen corresponds to the seven heavens and the airspaces in between them. And when he begins, he should begin with white (as it is written) 'corner' [*Bemidbar* 15:38] (that is to say from) the same type as the corner; and when he ends he should end with white (since) we increase in holiness and do not decrease.¹⁰

The standard contemporary *tzitzit* has four *hulyot*, which doesn't seem to correspond to any of the criteria mentioned here. In addition, whilst the specification to begin and end tying with a white string is clear enough, the first part of the pericope contains an obvious, but

⁶ *Menabot* 43b וז שקולה מצוה זו

⁷ *Shelach* 16: אלא מצוה להביא לבן ותכלת וינעשה. אימתי, פשיהיה תכלת. ועכשו אין לנו אלא לבן

Korah 12: ציצית, שש מאות. שמונה חוטין ונחמשה קשרים, הרי שש מאות ושלש עשרה

⁸ *Peirusb haRamban al haTorah*, *Bemidbar*, 15:31/39.

⁹ *Menabot* 39a

¹⁰ *Menabot* 39a. The closing statement is to be explained as follows. The Torah specifies that the *tekhelet* should be placed on *ציצת הכנף*, which indicates that the first winding should be from the white string, which is of the same type as the garment (most garments being undyed, and thus 'white'). Since one uses a white string to wind first, this has more holiness than the *tekhelet* string; therefore, one should finish winding with it also in accordance with the principle that we increase in holiness and do not decrease.

unremarked upon, internal problem. The *Gemara* cites the opinion of Rabi that one should wind three times and then an anonymous opinion that one must tie no fewer than seven times, but three is clearly less than seven!

The different ways of reconciling these two statements form the basis of all the different opinions concerning how one should tie *tzitzit* with *tekhelet*. In fact, despite the proliferation of different tying models, they are all reducible to three different interpretations, which we shall now review in turn.

Interpretation 1: Rav Amram Gaon

This interpretation, as well as being the oldest we can document, also represents the most straightforward way of interpreting the *sugya*. Simply put, the requirement stated in the name of Rabi (to do 3 times) refers to the number of windings (or *k'rikhot*) within a *hulya*, whilst the second specification (to do between 7 and 13 times) refers to the number of *hulyot* in total. In accordance with the closing statement, the first *hulya* must be composed of white threads, and so must the last; all the ones in between must alternate. The complete *g'dil* (tied portion) of the *tzitzit* will therefore look like this (if one makes the minimum seven *hulyot*):



According to a survey conducted by the P'til Tekhelet institute, only 1% of *tzitzit* wearers follow the *shita* of Rav Amram Gaon. This may be because it is the one that look most radically unlike conventional modern *tzitzit*. Alternatively, it may be because following this method makes it hard to make the *g'dil* four thumb-widths long, a requirement brought by the *Shulhan Arukh*, following *Tur* and *Rosh*.¹¹ However, the *shitot* of the *Ba'al Sefer haHinukh*, *Gra* and the *Ba'alei Tos'fot* also follow this interpretation. They differ only in wanting to incorporate the five knots referred to in *Midrash Tanhuma*. All three of these opinions follow the view of *Rambam* and others that it is preferable to have 13 rather than 7 *hulyot*. Accordingly, there are fourteen possible spaces to distribute these five knots, resulting in 1,001 potential combinations. Rav Amram Gaon's opinion is also followed by *Ba'al haIttur*, who recommends, instead, placing a knot in between each *hulya*. If we include also those who follow these opinions, we find that roughly half of all *tekhelet* wearers follow this opinion.¹²

Interpretation 2: Rambam

Rambam agrees with Rav Amram Gaon that there should be between 7 and 13 *hulyot* and that each *hulya* should contain 3 winds. However, he offers a different interpretation of how to incorporate the requirement to begin and end with white. According to *Rambam*, only the very

¹¹ OH 11:4

¹² <http://www.tekhelet.com/TekheletSurveyResults.html> (September 10, 2013)

first and last winding should be of white; all the others should be with the *tekhelet* string. This leads to the problem that the different *hulyot* will not be easily distinguishable. Accordingly, *Rambam* specifies that a gap should be left between each *hulya*. He does not describe how one is to go about making these gaps in such a way that they should not collapse, but Yemenite Jews have preserved a tradition, which they followed even without *tekhelet*, involving a rather intricate method. The complete *g'dil* tied according to the *Rambam* should look like this (if one makes the minimum seven *hulyot*).



The opinion of *Rambam* was followed by Yitzhaq Luria, the Ba'al haTanya and the Radzyner Rebbe, the last of whom pioneered the modern search for the *hilazon*. However, they too sought to incorporate the five knots mentioned in *Midrash Tanhuma*, which are deemed to have kabbalistic significance. In addition, Rav Hershel Shechter, one of the most important Rabbinical authorities to endorse the *murex trunculus*, and the only one to offer his own tying *shita*, follows the *Rambam*, whilst advocating adding a knot between each *hulya*.¹³ The combined popularity of these *shitot* comes close to rivalling that of interpretation 1.

Interpretation 3: Natronai Gaon/Ra'avad

The third interpretation, that of the Natronai Gaon reported by *Ra'avad*, is certainly the least popular. It is also not as easy to understand as the others, so we shall need to take a close look at what *Ra'avad* writes in his *hasagot* on *Rambam*:

זה הסדר אין לו שרש ולא ענף ולמה יותר בתכלת מבלבן שהוא מין כנף וממנו מתחיל ובו מסיים ובכריכותיו הוא ממעט אין זה כי אם שגיון גדול, והגאון רב נטרונאי ז"ל סידר אותו יפה סידור נאה מאד על דרך שאמרה ההלכה. וכמה שיעור חוליא כדי שיכרוך וישנה וישלש אתכלת קאי. ותנא דתנא הפוחת לא יפחות משבעה על הכריכות קאי שהן שלש מן התכלת וארבע מן הלבן מפני שמתחיל בלבן ומסיים בלבן. קושר תחלה סמוך לכנף קשר אחד בחוט לבן ובחוט של תכלת והוא שנקרא קשר העליון ואחר כך כורך שני חוטין אחד של לבן ואחד של תכלת עד שש כריכות והשביעית לבן לבדו וזהו שבע שאמרנו והן חוליא אחת ואלו הכריכות כולן על ששה החוטין המשלשלים והמשולשלים בכנף ובענין זה עושה ה' קשרים ובין כל קשר וקשר חוליא של שבע כריכות כאשר אמרנו, ונהגו לעשות חוליא אחת בשני קשרים סמוך לכנף ושתי חוליות בסוף הגדיל עם שלשה קשרים ובאמצע כורך בלא דקדוק בין מכונס בין מפוזר בתכלת ולבן עכ"ל

This method (of *Rambam*) has neither a proper tied section, nor hanging section. And why does he use *tekhelet* more than white, since white is the *min c'naf* and one starts and ends with it, why should he use it so little? This is all a great error. And the Gaon R. Natronai *zal*, described well a very nice method, according to what *halakha* states. "The phrase "and what is the measure of a *hulya*? He should wind and repeat and do a third time" refers to the *tekhelet*. And that which states "he should do no less than 7 [or more than 13]," refers to the number of windings, which are 3 of *tekhelet*

¹³ Rav Schachter also adds that one or more of the *hulyot* should be made of seven windings.

and 4 of white, since he begins and ends with white. One ties first close to the garment with one string of white and one of *tekhelet* and ties a knot and this is the 'upper knot' and then he winds two strings, one of white and one of *tekhelet* until he gets to six winds and the seventh he makes of white alone, and this is the "seven" they were referring to, and they constitute one "*hulya*". And these two strings are wrapped around the other six hanging down, and according to this method he should make five knots and between each knot a *hulya* of seven winds as we have said. **And the custom is to make the first *hulya* with two knots close to the garment and two *hulyot* at the end of the *g'dil* with three knots and in the middle he wraps without precision whether close or spread out with *tekhelet* and white."**¹⁴

Whereas the first two interpretations explained the apparently contradictory statements in the *Gemara* as referring to two different things, this interpretation demonstrates that they can be understood as referring to the same thing without being contradictory. Once one assumes that the white and blue strings were wrapped alternately, everything falls into place: a *hulya* comprised of seven wraps and beginning and ending with white, as the *Gemara* states, would naturally have three winds of *tekhelet* in it, like so (again assuming a minimum of seven winds):



Since both of the two numbers have now been accounted for, it would seem that the number of *hulyot* has been left unspecified; one can make as many or as few as one wants. However, Natronai Gaon as quoted here then goes on to say something incompatible with that: namely that the custom was to make one *hulya* near the garment, two *hulyot* at the end and then, presumably in order to make up the number of five knots, to leave a section in the middle, which could be tied in any way. However, according to what we have just said, this section should just be a fourth *hulya* tied in the same way as the others! The only way the last lines make sense is if we interpret Rabi's statement to "wind, repeat, and do a third time" to refer to the number of *hulyot*. However, if that is the case then we lose the basis for assuming that the windings are done alternately white and *tekhelet*. It could be that one should make two *hulyot* entirely of white and a middle one of *tekhelet*.

In order to resolve this apparent contradiction, we must say that there appear to be two different interpretations of the *Gemara* contained within this passage. The first (which we shall refer to as *Ra'avad* (i)) leaves the number of *hulyot* unspecified, mandating only that each one should be composed of alternating white and *tekhelet* strings, beginning and ending with white and containing no less than 7 and no more than 13 windings in total. The second (which we shall refer to as *Ra'avad* (ii)) would appear to specify that *hulyot* be constructed in the same

¹⁴ *Mishneh Torah, hilchot tzitzit* 1:7.

way, but adds that there should only be three, whilst allowing for the inclusion of pseudo *hulyot*, one of which is necessary to make up the desired number of five knots.¹⁵

Arguments in favour of the interpretation of Natronai Gaon/Ra'avad

Whilst this third interpretation is not the most intuitive understanding of the *Gemara*, it can account for all the data. There are also good reasons for thinking it is the correct understanding. I shall briefly deal with two reasons that I have seen offered elsewhere before detailing my own new arguments.

The first argument concerns the length of the *tzitzit*. The *Gemara* specifies that the minimum length of the *tzitzit* is four thumb-widths.¹⁶ It is true that *Rashi* interprets this to refer to the *anaf* (the bottom portion with loose strings) and that *Rabeinu Tam* interprets it as referring only to the *g'dil* (the portion consisting of tightly wound strings), the latter interpretation being adopted by the *Shulhan Aruch*, following *Rosh*, as *halacha*.¹⁷ However, the simplest reading is that followed by *Rambam*, which takes it to refer to the entire length of the *tzitzit*. Another statement specifies that the most beautiful way of tying *tzitzit* is to have a 1:2 ratio between the *g'dil* and *anaf*.¹⁸ It follows that if one ties *tzitzit* according to the minimum length, the *g'dil* should be only one and a half thumb widths long, or a little less than 2 cm.

Now, according to the interpretation of Rav Amram Gaon, the *g'dil* must include a minimum of 21 windings plus at least one knot (and, realistically, one on each end of the *g'dil* if it is to last for any length of time). If we estimate the width of a piece of string to be 1 mm, then, even with extremely tight winding, and small knots it unlikely the *g'dil* can be made small enough. This is even more the case according to the interpretation of the *Rambam*, which must include a further six gaps. Conversely, according to *Ra'avad* (i), it would be quite easy to make a *g'dil* with seven windings and a knot on each end that was lower than this limit. It is therefore easy to understand why it was necessary to state a minimum length. According to the other interpretations, it is not easy to see why the *Gemara* would need to specify a minimum length that is less than what is necessary simply to meet the other requirements of a *g'dil*.

The weakness of this argument is that the *Gemara* also states that a *tzitzit* that is mostly *g'dil*, whilst not ideal, is kosher.¹⁹ It is possible that the minimum length of a valid *tzitzit* to be valid is 8-9cm but in order to fulfil the *mitzvah* in the ideal fashion it must be longer. It is even

¹⁵ In the literature and images propagated by the P'til Tekhelet institute that I have seen over the years, no distinction is made between the two versions of the 'Ra'avad Method', but there has been a certain degree of confusion as to which interpretation they advocate.

¹⁶ *Menabot* 41b. See also *Sifrei Devarim* 234.

¹⁷ *OH* 11:4.

¹⁸ *Menabot* 39a

¹⁹ *Menabot* 39a

אמר רב ירמיה בר אבא אמר רב תכלת שכרך רובה כשרה ואפילו לא כרך בה אלא חוליא אחת כשרה ונויי תכלת שלישי גדיל ושני שלישי ענף

possible that the minimum length is *d'orayta* and, since the whole structure of windings and *hulyot* is only *d'rabanan*, it is impossible to incorporate them within the minimum shiur. Nevertheless, the existence of this minimum length would seem to accord most easily with *Ra'avad* (i).

A second argument is simply that *Ra'avad's* method is far easier to tie than the other methods. Anyone who has ever tried to tie alternating white and blue *hulyot*, or blue *hulyot* with spaces in between, will be aware of how difficult it is to avoid ending up with 2 ½ or 3 ½ windings, to switch between strings without their unravelling, to tie a knot without undoing the previous *hulya* entirely, or to leave gaps that will endure. It is for this reason that P'til Tekhelet maintains a tying bureau to which one can turn in order to get decent looking *tzitzit*. It is true that someone well practised will have little trouble with any *shita*, but it is certainly easiest for the ordinary person to produce a neat, attractive *g'dil* by following *Ra'avad's* method. This might at first sight seem a trivial consideration, but the *Gemara* consistently assumes that placing *tzitzit* on a garment is something each man can and should do for himself; this assumption is most easily consistent with *Ra'avad's* interpretation.

Neither of these arguments are conclusive, but they do suggest that *Ra'avad's* interpretation perhaps deserves more credence than it is given. We shall now move on to two more complicated arguments in its favour.

Argument 1: The Unknown *Mesorah*

I wrote earlier that Yosef Caro's *Shulhan Arukh* seems to provide us with little guidance on how to tie *tzitzit* with *tekhelet*. In the most obvious sense this is certainly true, but, in fact, it contains a remarkable nugget of information with enormous implications for our question. Everyone knows that the four *hulyot* of *tzitzit* should have 7, 8, 11 and 13 winds respectively, but that is not quite what the *Shulhan Arukh* says:

ונוהגין לכרוך ז' כריכות ובשני ט' ובשלישי י"א וברביעי י"ג שעולים כלם מ' כמנין ה' אחד שעולים
ל"ט ועם השם הם מ'.

And the custom is to wind 7 windings, and in the second (*hulya*) 9, and in the third 11 and in the fourth 13, which makes a total of 40, corresponding to the *gematria* of 'Hashem is one', which is 39 and plus *Hashem*, makes 40.²⁰

The rather unconvincing nature of this numerology is evident and the *Mishnah Berurah*, citing kabbalistic sources and the consensus of *Aharonim*, comments that the second *hulya* should have 8 rather than 9 windings.²¹ This makes for a more satisfying *gematria*, but only at the expense of altering the practise recorded by the *Shulhan Arukh*.

²⁰ *Shulhan Arukh, Orakh Hayim*, 11:13

²¹ *Mishnah Berurah, Orakh Hayim*, 11:70.

It seems clear enough that the *gematria* is not the reason for this practice, but only an *ex post facto drasha* designed to imbue it with significance. The actual historical reason for this practice must be sought elsewhere. In fact, we do not have to look far, because, in his commentary on *Tur*, from which the *Shulhan Aruch* was distilled, Yosef Caro himself provides a much more plausible explanation.

ואני ראיתי שנוהגים לכורך באויר ראשון ז' כריכות ובשני תשעה ובשלישי י"א וברביעי י"ג שעולים כל הכריכות מ' כמנין ה' אחד שעולה ל"ט ועם השם עולה מ' ונ"ל שטעמם לפי שהם סוברים דהא דתניא לא יפחות משבע ולא יוסיף על י"ג אכריכות שבין קשר לקשר קאי כפירוש אחרון שכתבו התוספות וכתבו נ"י ומש"ה מתחילין בז' דהפוחת לא יפחות משבע ועולים והולכים משום דמעלין בקודש וגומרים בי"ג שהיא תכלית העלייה שאין מוסיפים עליהם:

And I have seen that they are accustomed to tie in the first space 7 ties, and in the second 9, and in the third 11, and in the fourth 13, which makes 40 winds in total, like the numerical total of [the letters in] אחד ה' which totals 39, which with G-d himself equals 40. And it appears to me that the reason is that they believe that 'it was taught, he shall not do less than 7 or exceed 13' refers to the number of windings between each knot, like the last explanation cited by *Tosefot* and written by *Nimukei Yosef* and that which they do in beginning with 7 is because 'he shall not do less than 7' and they increase because of [the principle of] 'we increase in holiness [and no not decrease]' and we finish with 13 which is the highest level upon which we do not add.²²

The *Tosefot* to which Yosef Caro is referring here simply reads ייש מפרשים לא יפחות משבעה כריכות בין כל קשר וקשר. According to this interpretation, each *hulya* may have anything between 7 and 13 windings, though *Tosefot* do not indicate how, according to this view, one should interpret the requirement to wind to 'wind and repeat and do a third time'. According to Yosef Caro then, the common practice of having four *hulyot* of 7, 9, 11, and 13 windings was based on this interpretation of the *Gemara*.

This is actually quite astounding. According to no less an authority than the *Shulhan Aruch* himself, the traditional way of tying *tzitzit* is *not* based on the understanding of the *Gemara* adhered to by almost all the *Rishonim*, according to which the Talmud specifies between seven and thirteen *hulyot* of 3 winds each. *mesorah* and the weight of Talmudic scholarship stand at odds. There is, however, good reason to argue that this custom is based not in the interpretation briefly alluded to by *Tosefot*, but specifically in the explanation of Natronai Gaon cited by *Ra'avad*.

According to *Ra'avad's* explanation, even though the lower and upper limits for windings are 7 and 13 respectively, there are actually only four possibilities. Since one must tie with alternate white and blue windings, finishing and ending with white, each *hulya* must have an odd number of windings, leaving only 7, 9, 11, and 13 as possibilities. According to the

²² *Beit Yosef* OH 11:23

interpretation above that we labelled *Ra'avad* (i), the number of *hulyot* is unspecified. An obvious idea is simply to do one of each of the four possible *hulyot*, starting with the lowest and ending with the highest. Simply replace the blue string with another white one and you have precisely the tradition attested to by Yosef Caro.

Like the *Beit Yosef* himself, I can offer no direct evidence for this hypothesis, but, if somewhat speculative, it offers us a solution to a problem raised by the *ba'alei Tosefot*. Commenting on the passage from the *Gemara* that forms the locus of our discussion, they ask why these fairly unambiguous *halakhot* were ignored in their own age. Their question was premised on the assumption that the *Gemara* specified between seven and thirteen *hulyot* of three windings each; they further assume, according to Amram Gaon's interpretation, that these *hulyot* were of alternating colours. Obviously, in the absence of *tekhelet*, these alternating *hulyot* would not be readily identifiable, but nevertheless certain ground-rules should apply. The total number of windings should be a multiple of three somewhere between 21 and 39 and if one wishes to add five (or any other number) of knots, the gaps in between should also be composed of a multiple of three. *Tosefot* explain that these rules were not adhered to in their age because their significance is tied to the imagery of the seven heavens and, in the absence of blue thread, this is not relevant.

Even accepting this as a halakhic explanation of why one *may* tie *tzitzit* in contravention of the *Gemara's* requirements, it cannot explain the *historical* question of why the Jewish people, even in the absence of *tekhelet*, should have decided *en masse* to start tying their *tzitzit* in a completely different way. A far more natural explanation is that they did not change their practice at all! When the Jewish people lost access to *tekhelet*, they continued tying *tzitzit* as they always had, only with a white string in the place of the blue. While the practical tradition remained unchanged, however, its association with the source in the *Gemara* was lost. The easiest local interpretation of what the *Gemara* says about *tzitzit*-tying is that of either Amram Gaon or the *Rambam*. The most convincing piece of evidence against that interpretation was lying in the *tzitzit* of millions of Jews, but the link between that and the *Gemara* had been long forgotten. Accordingly, instead of explaining the *Gemara* with reference to ordinary practice, as would doubtless have happened but for the loss of *tekhelet*, the normative interpretation was arrived at on purely textual grounds, and the divergence of contemporary practice from this norm was treated only as a problem to be explained.

We may also make a further suggestion. As we noted before, the custom of placing five knots on one's *tzitzit* probably arose as response to the loss of *tekhelet*, investing the *mitzvah* with some of the significance it had lost. However, we may ask whether its origin lay in the practice we have described. While it is strictly possible to separate *hulyot* without making knots, it is certainly much easier to do so with them. If the common practice was to make four *hulyot* according to the four possible options of 7, 9, 11 and 13, the natural corollary would have been to make five knots. It is likely that when the post-Talmudic midrashic

authors arrived at their *d'rasha* in which the five knots are used to add up to 613, they were drawing on what was already the common practice based on way of tying *tzitzit* recorded by Natronai Gaon.

There is one more piece of evidence that supports this interpretation, though it forces us to qualify it somewhat. Both *Rashi* and *Tosefot* record a practice of distributing the five knots between two that are close to the garment and three close to the *p'til*.²³ They both offer the same explanation, namely מעלין בקודש ולא מורידין. In the *Gemara*, this was quoted as the reason for making the last as well as the first winding of white, whereas here it is taken to mean that one should make more knots at the conclusion than the end. This concept is open to an obvious objection: if the five knots are a post-Talmudic custom, on what grounds should we assume they have any *kedusha* at all? Furthermore, a simple parallel with the *Gemara* would imply only that one should start with a knot, just as one begins; the *Gemara* clearly does not mean to imply that there should be more white at the bottom of the *g'dil* than at the top.

We can resolve this problem by again looking at the practice without the prism of what may, again, be an *ex post facto* rationalisation. What does it mean to have two knots close to the garment and three close to the *p'til*? Presumably, it means that there are three *hulyot* of equal or similar length, one immediately after the first knot and two next to the last knot, each with a knot on either end. In between the second and first knot there must be much larger *hulya*, with the result that two knots are close to the garment and three close to the *anaf*:



In fact, this practice is precisely the one we saw recommended towards the end of the *t'shuva* of Rav Natronai Gaon, that which we labelled *Ra'avad* (ii). The likeliest explanation, again, is that *Rashi* and *Tosefot* were trying to explain a custom based on one interpretation of the *Gemara* through the lens of their own incompatible interpretation. The real reason Jews in France were tying in this manner is because they were making three real *hulyot* with a longer pseudo *hulya* in the middle, according to the view that there should be three *hulyot*, each containing seven to thirteen winds. The explanation of *Rashi* and *Tosefot* was devised to rationalise this practice in accordance with a different understanding in which there should really be between seven and thirteen *hulyot*, each consisting of three winds each and according to which the prevalent practice was otherwise unfathomable.

We have seen, then, that two otherwise perplexing traditions attested to by the *Rishonim* are best explained by the existence of a *mesorah* in which *tzitzit* were tied according to the method recorded by *Ra'avad*. One, recorded by the *Beit Yosef*, points to *Ra'avad* (i), and the other,

²³ *Menabot* 39a *Rashi*: הלכך עבדינן שני קשרים מלמעלה ושלשה מלמטה משום מעלין בקדש ואין מורידין
Tosefot: וכן נוהג רבינו תם לעשות אותן ה' קשרים ב' בסמוך לטלית וג' סמוך לפתיל משום מעלין בקדש ולא מורידין

recorded by *Rashi* and *Tosefot*, points to *Raavad* (ii). Though there are other explanations for the methods of tying they describe, the simplest is that traditional practice in both Spain and France was based on an understanding similar to that of Natronai Gaon. This does not, of course, demonstrate that this was the original method of tying *tzitzit*. It may well be that Natronai Gaon himself was responsible for spreading the practice, but this seems less likely given how little known or appreciated his *teshuva* on the subject appears to have been. More likely, he was attesting to the original practice, whilst other halakhic authorities took up competing plausible, but erroneous, interpretations of the *Gemara*, which, unbeknownst to them (thanks to the loss of *tekhelet*), were not in accord with the traditions of the Jewish people.

Argument 2: The time of *Q'riat Shema*

The second *halakha* in Mishnah *B'rachot* states that the earliest time for reciting *Shema* in the morning is משיכיר בין תכלה ללבן, when one can tell the difference between *tekhelet* and white. The Talmud *Bavli* asks what exactly the Mishnah is referring to: if it is to two pieces of wool, one dyed blue and one white, then these can be told apart even at night. The *Gemara* answers that the distinction is between תכלת שבה ללבן שבה, between the *tekhelet* that is in 'it' and the white that is in 'it'. To what does this 'it' refer?²⁴ *Rashi's* answer is that it refers to a piece of wool with streaks of white and *tekhelet*. *Tosefot*, however, dispute this explanation based on the *Gemara* in *Menaḥot*, which states that the *mitzva* of reciting *Shema* is dependent on the *mitzva* of *tzitzit*.²⁵ The *Gemara* there indicates that the Mishnah is referring to someone looking at his own *tzitzit*. When there is enough light from the as yet unrisen sun for him to be able to differentiate between the strings of white and *tekhelet*, then he can recite *Shema*. This explanation is most plausible since, according to it, the Mishnah is providing practical and relevant advice to the observant Jews of the age, all of whom, with few exceptions, would have worn *tzitzit* including both white and *tekhelet*. It is far harder to understand why the Mishnah would choose to advise Jews to base their decisions based upon an incompletely dyed piece of wool.

This piece of information has interesting implications for our question. If we recall, the three different methods of tying *tzitzit* lead a very different distribution of blue and white areas on the *g'dil*. According to *Rambam*, almost the entirety of the *g'dil* is blue with only one winding of white at each end. According to Amram Gaon the *g'dil* is divided into fairly large blocks of blue and white. According to Natronai Gaon, however, the *g'dil* is made up of alternate windings of blue and white. It should be clear that the visibility of the blue and white areas in the three options in the dark is very different.

One factor to consider is that, according to Natronai Gaon, the difference between the white and *tekhelet* threads can be perceived roughly equally whether we are talking about the *g'dil* or the *anaf*. In either case, we are talking about the thickness of one string of white and blue

²⁴ B *B'rachot* 9b.

²⁵ *Menaḥot* 43b. See also Y *B'rachot* 7b

respectively. According to the other methods, it would be much easier to distinguish between the *tekhelet* and white in the *g'dil* than those in the *anaf*, especially according to the *Rambam*. It is, at least, slightly odd, therefore, that in neither Talmud is it specified what part of the *tzitzit* the Mishnah is referring to. This is, of course, a far from irrefutable proof. A more convincing argument can be made based on empirical methods.

Simply put, if one can tell the difference at night between *tekhelet* and white on any one of these methods, *tzitzit* tied according to that method cannot be a useful indicator of whether it has become sufficiently light to say *Shema*. It follows that it is very unlikely that the Mishnah in *B'rachot*, or the passage in *Menahot* based upon it, had such a tying method in mind.

Actually carrying out such an experiment, however, is difficult for a number of reasons. First, *tzitzit* strings can come in different thicknesses and I am not aware of any method by which we can reasonably claim to know their typical diameter at the time of the Mishnah. Secondly, the term '*tekhelet*' covers a range of hues from pure indigo to indigo-purple and the intensity of this colour can vary quite widely depending on how concentrated the dye mixture is and how long the string is soaked in it. Again, we cannot claim to know how dark or intense the typical mishnaic era string was. Thirdly, the amount of natural light present during the night is not constant, but varies depending on where the moon is in its cycle. Finally, conditions in the age of widely available electric lighting and consequent light pollution are very different to those two thousand years ago, meaning that to test this out one has to travel into the countryside or desert.

I have not myself conducted an exhaustive and controlled investigation of the question, but what I have found is that, under conditions of natural light from the moon and the stars, it is possible to distinguish the blue and white *hulyot* in the *g'dil* according to the interpretation of Rav Amram Gaon or one of its derivatives whereas it is not possible to distinguish between individual windings in a *g'dil* tied according to the method of *Ra'avad*. This strongly suggests the *Ra'avad's* method, or at the very least one that involves alternate blue and white windings rather than alternating blocks, is assumed by *Hazal* in their discussions of the earliest time to say *q'riat Shema*. Interested readers can confirm this or otherwise for themselves.

Conclusion:

I hope that in this essay I have presented two persuasive and not widely appreciated reasons why greater attention should be paid to a relatively neglected way of tying *tzitzit*. How to actually go about tying one's own *tzitzit* is, like any halakhic issue, a matter for competent rabbinic authorities.²⁶ Moreover, none of the arguments presented here can help us decide which of the two interpretations of Natronai Gaon's method is the correct one. I hope, only,

²⁶ My own practice to follow *Ra'avad* (i) is based on the ruling of Rav David Bar Hayyim שליט"א, some of whose arguments are included in my article, see: <http://machonshilo.org/en/eng/list-ask-the-rav/53-ssissith-tphillin/430-tying-ssissith->

that the arguments I have presented above will help to inform debate about how to most perfectly fulfil a *mitzvah* that we, after over a thousand years, have once again been blessed with the opportunity to perform in all its aspects.