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Accurate Measurements

The *Mishnayot* (5:4-5) set down some rules for measuring the 2000 *amot* of the *techum* (the boundary beyond which a person may not travel on *Shabbat* - approximately 1.1-1.2 kilometres). *Rambam* explains in his commentary to the *Mishnah* that every measurement has some degree of inaccuracy. The *Chachamim* enacted a number of detailed rules to ensure that the *techum* is measured in such a way so as to minimise this inherent inaccuracy.

There is an interesting tension between the *Chachamim's* desire to make the measurement as accurate as possible and the various constraints and practicalities within which the *Chachamim* operate and which reduce the accuracy of the measurement. For example, the *Shulchan Aruch* (399:1) rules that the *techum* should only be measured with a rope made of linen. The *Chachamim* have a tradition to this effect which is supported by a reference in *Yechezkel* (40:3) to linen rope being used for measuring. The *Gemara* (*Eiruvim* 58a) quotes a *Baraisa* explaining that iron chains are actually the most suitable for measuring because they do not stretch. However, as the *Baraisa* explains, the *Chachamim* are constrained by the *Torah's* preference for rope. Some commentators (including the *Meiri*) hold that metal chains can actually be used, although as stated above, this is not the view of the *Shulchan Aruch*.

Being restricted to linen rope, the *Chachamim* have sought to minimise the inaccuracy of the measurement by various rulings. For example, the size of the rope used to measure the *Techum* is restricted to 50 *amot*. Any longer than this and the rope will sag; any shorter and it will stretch. The *Shulchan Aruch* (399:3) rules that the surveyors must pull the rope with all their might when performing the measurement. The *Mishnah Berurah* explains that otherwise the rope will be weighed down in the middle and the measurement will therefore be inaccurate. Furthermore, the *Mishnah Berurah* (399:7) rules that the surveyors must be experts who are familiar with the laws concerning the measuring of the *techum*.

The *Chachamim* have also allowed a number of leniencies on the basis of practicalities. For example, the *Ritva* (5:4) notes that the most exact way to measure the *techum* is to lie the rope down on the ground. However this is physically difficult for the surveyors to do. Therefore the *Chachamim* allowed the surveyors to hold the rope at chest level, even

though the accuracy of the measurement will thereby suffer. Designating a standard body part ensures that the rope is kept horizontal to the ground ensuring a more consistent measurement. As a practical measure, the *Chachamim* did not take into account differences in height of the surveyors and assumed that the surveyors will be of average height.

Further examples of leniencies allowed by the *Chachamim* are allowing surveyors to effectively ignore mountains (5:4) and believing a single witness, even if that witness is a slave, in matters relating to the location of the *techum* (5:5).

Previously (4:11) we saw that that by following the method prescribed by the *Chachamim*, the surveyors actually end up 15 *amot* short of 2000 (due to the length of rope that is held in their hands while measuring - see *Rashi Eiruvim* 52b). This is a built-in buffer to allow people who accidentally leave the *Techum* to return.

As we saw in last week's *Mishnah Yomit*, the laws relating to the 2000 *amot techum* are *d'rabbanan*. The *Chachamim* did not make them subject to all of the stringencies that apply to *d'oraita* laws and they enacted the laws with a provision that they be treated leniently (*Rashi Eiruvim* 58b). The *Chachamim* are still concerned that the 2000 *amot* be measured as accurately as possible but as we saw above they included certain leniencies where they deemed them to be appropriate.

Of course, in some cases it is not possible to accurately measure the 2000 *techum* border. For example, the *Mishnah* (4:4) discussed the case of a person who was in the middle of a journey when *Shabbat* was about to begin. This person's *techum* is generally measured from their place at the onset of *Shabbat*. Obviously in these circumstances this person's *techum* could not be measured accurately in advance before *Shabbat*. The *Chachamim* allowed such a person to estimate their *techum* on *Shabbat* on the basis that one medium stride is approximately equal to one *amah*. The *Biur Halacha* (399:1) explains that one must not measure out the full 2000 footsteps to allow for the fact that each footstep may actually be longer than one *amah*. This is another example of the tension between practicalities and measuring the *techum* accurately.

Alon Ledder

Revision Questions

עירובין ה' ג' – ה' ז'

- What is the maximum space between three cities placed in a triangular formation such that they can be considered one city (ה' ג:)?
- How long was the measuring tape used to measure the *techum Shabbat*? (ה' ד:)?
- Was the measuring tape placed on the floor, held at chest level or above their heads? (ה' ד:)?
- When measuring, what would they do when they came to a hill? (ה' ד:)?
- Who was trusted with measuring out the *techum Shabbat*? (ה' ה:)?
- If one of two measurements on one side was greater than the other, which measurement was used? (ה' ה:)?
- What is the difference between a *shituf* performed on a city of a *yachid* and a city of the *rabbim*? (ה' ו:)?
- What is the law regarding a city of a *yachid* that became a city of the *rabbim*? (ה' ו:)?
- If one sent his son to place an *eiruv techum* in the West of the city, but he was in the East of the city (at a distance of greater than 2000 *amot* from the *eiruv techum*) at the onset of *Shabbat*, where can he walk on *Shabbat*? (ה' ז:)?
- Does an *eiruv techum* work if it is placed in the *ibur* of the city? (ה' ז:)?
- Explain the debate regarding the case where two cities (large and small) were close to each other such that that part of the large one was inside the *techum* of the other and a citizen of the small city placed his *eiruv techum* inside the large city – how far can he walk? (ה' ח:)?
- Which other case resembles the debate described in the previous question? (ה' ט:)?
- Explain the debate regarding when the presence of a *goi* can affect an *eiruv chatzeirot*? (ה' י:)?
- Explain the debate regarding how a *tzaduki* can affect an *eiruv chatzeirot*? (ה' י:)?
- If one of the members of a *chatzer* forgot to join in the *eiruv chatzeirot* yet was *mevatel reshut* in the *chatzer* where can each of the members of the *chatzer* transfer objects? (ה' י:)?
- Regarding the previous question, what if he was not *mevatel reshut* but the rest of the residents were *mevatel reshut* in the *chatzer*? (ה' י:)?
- Explain the debate regarding the latest time when one can *mevatel reshut*? (ה' י:)?
- Explain the debate regarding a case where one was *mevatel reshut* yet inadvertently carried something into the *chatzer*? (ה' י:)?
- In which case do *Beit Shammai* and *Beit Hillel* disagree regarding an *eiruv chatzeirot* for people living in the same building and when do they agree? (ה' י:)?
- If two brothers live in different apartments in an apartment block, yet are still supported by their father, when do they need to each provide bread for the *eiruv chatzeirot* and when can one suffice for them both? (ה' י:)?

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Next Week's Mishnayot...

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	שבת קודש
4 th December ג' כסלו	5 th December ד' כסלו	6 th December ה' כסלו	7 th December ו' כסלו	8 th December ז' כסלו	9 th December ח' כסלו	10 th December ט' כסלו
Eiruvin 6:8-9	Eiruvin 6:10-7:1	Eiruvin 7:2-3	Eiruvin 7:4-5	Eiruvin 7:6-7	Eiruvin 7:8-9	Eiruvin 7:10-11

