

Measuring Heaven and Earth

The Talmud is replete with discussions about quantities and measurements of all manner of items relevant to what constitutes *halachic* observance. One quickly notices that measures are often relative to objects and mathematical calculations available to the Sages, as compared to objective “scientific standards”. Notwithstanding the rudimentary tools of science available in the Talmudic era, there are strenuous attempts by the Rabbis to be as accurate and precise as possible – and at other times there seem to be values governing measures with little or no connection to mathematical principles. I will attempt to analyze 3 sugyas we studied in Daf Yomi, to derive an underlying theme differentiating cases of accuracy, precision, or some other driving principle behind the measurements.

First, we encounter the following sugya, discussing how we know that the minimum height of a Sukka needs to be 10 handbreadths. After arcane derivations ranging from the dimensions of the Tabernacle and its vessels, to the size of the face of the Bar Yokhani bird, an eye-opening statement is made by Rabbi Yehuda as to the origin of the 10-handbreadth measure:

[סוכה ה' ב:י"ג](#)

אָלָא, לְרַבִּי יְהוּדָה הִלְכָתָא גְמִירֵי לֵהּ. דְּאָמַר רַבִּי חֲזִיָּא בַר אֲשִׁי אָמַר רַב: שִׁיעוּרֵינוּ, חֲצִיצִיּוֹן, וּמְחִיצִיּוֹן — הִלְכָה לְמִשְׁפָּה מִסִּינַי

[Sukkah 5b:13](#)

Rather, according to **Rabbi Yehuda**, the Sages **learned** the minimum height of a *sukka* as a *halakha* transmitted to Moses from Sinai. **As Rabbi Ḥiyya bar Ashi said that Rav said: The measures** in various areas of *halakha*, e.g., olive-bulk, dried fig-bulk, egg-bulk, **and** the various *halakhot* of **interpositions** that serve as a barrier between one’s body and the water in a ritual bath and invalidate immersions, **and** the dimensions and nature of halakhic **partitions** are all *halakhot* transmitted to **Moses from Sinai**. They were not written in the Torah; rather, they were received in the framework of the Oral Law.

Essentially Rabbi Yehuda is conceding we don’t know the basis for the measurement of the minimum qualifying height of a *sukka*, rather we attribute it to Oral Law transmission directly to Moshe from Hashem at Mt. Sinai. The Rabbis rebut Rabbi Yehuda, with examples of how, to the contrary, various other measurements (for example the time required to become ritually impure when entering a leprose house) are absolutely and explicitly learned from Biblical sources.

So we are left with opposing views as to the origins of the 10-handbreadth measure, and a lack of clarity as to who exactly is responsible for determining the measures.

In a second example there is the following discussion of the minimum qualifying size of a round *sukka*:

אמר רבי יוחנן: סוכה העשויה ככפון, אם יש בהקיפה כדי לישב בה עשרים וארבעה בני אדם — כשרה, ואם לאו — פסולה

[Sukkah 7b:19](#)

Rabbi Yohanan said: With regard to a *sukka* that is **shaped like a furnace** and is completely round, **if its circumference has sufficient space for twenty-four people to sit in it, it is fit, and if not, it is unfit.**

The Gemara goes on to analyze this position of Rabbi Yohanan, specifically how he arrived at the size to accommodate 24 people. Mathematically, assuming a person occupies 1 cubit, the more precise calculation – considering Rabbi Yohanan follows Rabbi Yehuda HaNasi whose minimum size of Sukka is 4x4 cubits – should be a circumference of 12 cubits (=12 people), since the Rabbis calculate Pi to be 3, and clearly understood the ratio between diameter and circumference. Rabbi Yohanan seems to require double the necessary circumference, which is neither accurate nor precise, by a large margin, even by the contemporary mathematical skills of his time.

The Rabbis grapple with such a large error in Rabbi Yohanan’s calculation, and attempt to explain his inaccuracy by proposing various geometric models of inscribed and circumscribed squares and circles to account for the number 24, and conclude that the error is simply too large to ascribe to mere approximation or rounding. They simply do not understand his rationale. The best defense mounted is to say that Rabbi Yohanan appropriately erred on the side of stringency, i.e. his larger minimum size of 24, albeit double the minimum, would at least not cause an invalid Sukka.

Again, we are left with an unsatisfactory understanding of the relative importance of numerical accuracy and precision in *halachic* measures, and who gets to decide them.

The last example, begins to shed light on a possible theme explaining the variance in numeric accuracy and precision and decision empowerment that we see from sugyas like those above.

From Gemara Bava Batra 23b:

בְּעֵי רַבִּי יִרְמְיָהוּ רַגְלוֹ אַחַת בְּתוֹךְ הַמְּשִׁים אִמָּה וְרַגְלוֹ אַחַת חוּץ מִן־הַמְּשִׁים אִמָּה מֵהוּ וְעַל דָּא אִפְקוּהוּ לְרַבִּי יִרְמְיָהוּ מִבֵּי מְדַרְשָׁא

Rabbi Yirmeya raises a dilemma: If one leg of the chick was within fifty cubits of the dovecote, and one leg was beyond fifty cubits, what is the halakha? The Gemara comments: And it was for his question about this far-fetched scenario that they removed Rabbi Yirmeya from the study hall, as he was apparently wasting the Sages’ time.

This sugya is often cited humorously, but I believe there is a profound underlying message to the seemingly frivolous question Rabbi Yirmeya asks, viz. “What is the ultimate purpose of measures”? Of course, at face value, we can easily appreciate that without delineating go/no-go conditions (i.e. measurements of pass/fail), we would not know how to conduct our actions in fulfillment of the commandments. Quantities and measurements are the currency of *Halacha*, without which we would not know how to act in this world we inhabit.

But digging deeper, who is empowered to decide what the basis of measurements are? Do the numbers descend from Heaven as it were (הִלָּכָה לְמִשְׁפָּה מִסִּינַי), or are they entrusted to humans to come up with a rationale and means of measuring (like Rabbi Yohanan deciding that 24 people in a circle is the minimum size of a circular sukka)?

While at surface level Rabbi Yirmeya’s question could certainly be seen to be a frivolous mockery of the Sages because he posed an absurd hairsplitting scenario that seemingly didn’t add any practical learning to the rulings already taught in the case in question (see the discussion in the Gemara text prior to his question), therefore requiring his ejection from the beit midrash, I believe he was in effect exposing a fine balancing point in *Halacha* that demanded a harsh response from the Rabbis. The fundamental power balance of *Halacha* I refer to, is intriguingly hinted at, just before the first sugya discussed above, in the lead up to the discussion of the source for a sukka needing to be 10 cubits tall.

From Sukka 5a:

וּמַנְיָא, רַבִּי יוֹסִי אוֹמֵר: מֵעוֹלָם לֹא יֵרְדֶה שְׂכִינָה לְמַטָּה, וְלֹא עָלוּ מִשָּׁה וְאֵלֶיהוּ לְמַרוֹם, שֶׁנֶּאֱמַר: “הַשָּׁמַיִם שָׁמַיִם לַיהוָה וְהָאָרֶץ נָתַן לְבְנֵי אָדָם”

and it is taught in a *baraita* that Rabbi Yosei says: The Divine Presence never actually descended below, and Moses and Elijah never actually ascended to heaven on high, as it is stated: “The heavens are the heavens of the Lord, and the earth He gave to the children of man” (Psalms 115:16), indicating that these are two distinct domains. Apparently, from ten handbreadths upward is considered a separate domain. Consequently, any *sukka* that is not at least ten handbreadths high is not considered an independent domain and is unfit.

So from this source, specifically Psalms 115:16, we see the famous dictum “הַשָּׁמַיִם שָׁמַיִם לַיהוָה וְהָאָרֶץ נָתַן לְבְנֵי אָדָם”, which is the ultimate empowerment of mankind in all earthy matters, giving us permission to construct the regulations and measures of our lives according to our God given abilities – but by the same token, an admonition, that we humans cannot and must not ever rise above the 10 handbreadths defining the separation of Heaven and Earth.

Now we can better understand what so offended the Rabbis in Rabbi Yirmeya's question: he was challenging them precisely at the seamline of Heaven and Earth, a line that we cannot ever cross. It wasn't the absurdity or unreality of his question per se that was the problem (there are many much more absurd hypothetical questions asked by various Sages, for example building a sukka on the back of a camel or using an elephant as a wall of a sukka), but what distinguished his question is that the Rabbis had already answered the 2 dominant most plausible scenarios of the chick being on one side or the other of the 50 cubits line, using sound rationale and measurements, hence there was no practical ramification to his question that could plausibly aid better adherence to *Halacha*. The Rabbis had already used the empowerment Hashem granted to mankind to good effect, to derive meaningful measures that inform actions, fulfilling the "separation of duties" and respecting the differences of the realms of God and mankind.

What Rabbi Yirmeya was effectively doing, was challenging the very legitimacy of this fine line of separation between God and mankind by posing a deliberately provocative "klutz-question" beyond the "10 handbreadths" of rational human empowerment defining the realm of mankind. It wasn't the accuracy (50 cubits) or the precision (1 chick leg to the left of the line, the other chick leg to the right of that line) that constituted his challenge, it was the fundamental lack of appreciation of the distinct but limited empowerment of mankind to operate only in the earthly realm by human rationale (which the Rabbis has adequately fulfilled), as distinct and impenetrable to the realm of Hashem, that he was threatening, and hence deserved censure.

Where is the 10-cubit line for each of us, between Heaven and Earth? Is it an objective universal measure (i.e. an external immutable reality), or personal and context dependent, relative and intrinsic to who we are individually? In the example of Rabbi Yirmeya, did it make a difference that it was him asking the question, or would anyone challenging authority in the way he did, be thrown out the beit midrash? Questioning brightly drawn lines, even with far-fetched scenarios, is evidently acceptable provided the questioner and their motivation is deemed *l'sheim shamayim* by the Rabbis of authority.

Like in the famous case of the 4 children at the Pesach seder, the wise and the evil ask the same question. But one is praised, and the other is severely censured. In the eyes of the Rabbis only one of the children chose and lived well, in the elusive and immeasurable zone between Heaven and Earth.

-Steve Sacho