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The "Poetic Itch" and Numerical Maxims in the Talmud: An Inquiry into Factors of Knowledge Construction

Abstract: This paper explores possible factors responsible for knowledge presented as numerical maxims found in the Babylonian Talmud. Written in a late Hebrew, the maxims follow the pattern "X 'things' do/are…" and have previously been analyzed in the context of mnemotechnical strategies and pedagogy. Yet the sheer number of these maxims — 54 sayings alone on "threes" — appears to contradict at least a straightforward connection with pedagogy. Indeed, the circumstances that produce a certain stock of knowledge are not necessarily identical with its future use. To trace the maxim's possible origins, Ausonius's "poetic itch," according to himself responsible for his *Riddle of the Number Three*, will serve as a starting point for an investigation into social and intellectual factors involved in the construction of this condensed form of knowledge: poetic contests, numerology, and the concept and place of pastimes in late-antique society. The paper will thereby show that incentives for accumulating knowledge were as multi-faceted as occasions to implement knowledge.

1 The Final Construct: Numerical Maxims in the Babylonian Talmud

Late-antique literature is characterized by its use of unattributed and attributed maxims.[1] Reason for the prevalence of the use of maxims (*gnomai*) as compared to antiquity was, complemented by other factors, the Greco-Roman curriculum and its exercises, the so-called *progymnasmata*. This curriculum acquainted the alphabetized pupil with the art of writing and argument-building. It introduced the simple maxim; its attributed form, which turns the maxim into a *chreia*; or the maxim that recalls someone's deed and hence becomes a reminiscence (*apomnemoneuma*).[2] The maxim is thereby presented to the student not as

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1 See Formisano 2007; Roberts 1988; Fontaine 1977.

2 This was especially the case in the *progymnasmata* by Aelius Theon 3.96; see Kennedy 2003, 15. The other *progymnasmata* translated by Kennedy introduce the *chreia*, a trope that builds

something static but, rather, as a trope that can be used in different contexts and for different purposes. Indeed, the different *progymnasmata*, throughout all their stages, continue to make recourse to maxims, e.g., as a concluding moral to a fable or a proof in an inquiry (*thesis*). Yet the *progymnasmata* are conspicuously quiet about how one should *compose* a maxim. Rather, the maxim is conceived of as a fixed entity, a brick that serves the late-antique art of "narrative bricolage," to borrow a term used by Reuven Kiperwasser to describe this very feature, which applies to Talmudic narratives as well.[3]

Many of the used maxims are quotes from ancient authors, brilliant lines that speak for themselves. There are whole compilations of maxims, however, that are attributed to otherwise unknown authors and incompatible with any known work.[4] These collections testify to the fact that maxims were not only intentionally collected but also likely purposefully composed. The collections of sayings were, among other things, certainly useful for teachers, who used them to craft model exercises for their students, while students may have used them to embellish their literary creations according to the previously described exercises. That maxims relate a timeless truth that makes them fit for education, does not, however, necessarily imply that they were originally intended to be used in schools or other instructional settings. Rather, they might have had their inception in educated vanity, intellectual competition, playfulness, leisure — maybe even a sort of productive boredom, a "poetic itch".

I would like to illustrate how such factors may have led to the composition of maxims by looking at the numerical maxims dispersed throughout the Babylonian Talmud (henceforth Talmud). It may well be that these numerical maxims once constituted distinct collections, which were then disassembled for the purpose of compiling the Talmud, in which process the maxims would have been detached from each other and inserted associatively to similar thematic threads. The numerical sayings in the Talmud have traditionally, and for fairly obvious reasons, been placed in the context of the biblical numerical sayings, which, in turn, are also attested in other literatures of the ancient Near East.[5] Wayne S. Towner and, more recently, Ariel-Ram Pasternak and Shamir Yona,

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on maxims, after fable and narrative, but likewise continue recommending its use throughout the subsequent exercises.

3 Kiperwasser 2018.

4 E.g., the Mishanic tractate Avot ("Sayings of the Fathers"), the *Apophthegmata Patrum*, or the late-antique and Byzantine collections of the *paroimographoi* or the *Gnomai of the Council of Nicaea*. Morgan 2007, 257, further mentions collections by Didymus Chalkenterus (Alexandria) and Lucillus of Tarrha (Crete).

5 See Pasternak/Yona 2016, 209.

have pointed to significant differences between this ancient "graded numerical parallelism" and the numerical maxims that appear in rabbinic literature.[6] The biblical graded parallelism is structured according to the formula *X and X+1*, as in the following example:

> *Three* things are beyond me; *Four* I cannot fathom: How an eagle makes its way over the sky; How a snake makes its way over a rock; How a ship makes its way through the high seas; How a man has his way with a maiden. (Prov. 30:18–20)[7]

The numerical maxim in rabbinic literature may also appear as graded parallelism, but it "separates the pair of numbers, and each number is situated in different stiches,"[8] e.g.:

> *Five* things in a burnt-offering can combine with one another: the flesh, the fat, the fine flour, the wine and the oil. And *six* in a thanksgiving-offering: the flesh, the fat, the fine flour, the wine, the oil and the bread. (m. Me'il. 4:2)[9]

The present paper will focus on such lists of "X 'things' do/are…" that appear — graded like this example, or ungraded — in every tractate of the Babylonian Talmud (except for b. Meg. and b. B. Metz.).[10] It is noteworthy that they are always in Hebrew and mostly use numbers 3, 4, 5, 6, 7, 8, and 10.[11] The fact that

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6 See Pasternak/Yona 2016; Towner 1973, esp. 12.

7 Quoted according to Pasternak/Yona 2016, 212.

8 Pasternak/Yona 2016, 225–226; see also Towner, 1973, 5–7.

9 Pasternak/Yona 2016, 226. The X+1 pattern is rare and always attributed to Ben Sira (Pasternak/Yona 2016, 237–238). Pasternak/Yona also draw attention to the rhetorical device of "gaping" (*hamshakhah*), used in the second verse, which omits the subject "things," thereby contributing to a more appealing syntax (Pasternak/Yona 2016, 237–238).

10 My research was based on the compound "X *things*." Yet, even the Vilna standard edition does not conclude with "things" (דברים) in every case. The results presented here are likely to be incomplete (but certainly not exaggerated) and may explain the absence of numerical sayings in b. Meg. and b. B. Metz. It is also noteworthy that the five talmudic tractates that differ in terms of technical language from the rest (b. Ned.; b. Naz.; b. Me'il.; b. Ker.; b. Tamid) also contain such lists.

11 *Lists of three:* b. Ber. 3a (2x), 7a, 42a (3x), 51a, 54b (4x), 55a (3x), 62a (2x the same); b. Shabb. 34a (3x), 75b, 87a; b. Eruv. 87b; b. Pesah. 42a (3x), 112b (2x), 113a (2x), 116b; b. Rosh Hash. 16b; b. Yoma 9b, 84a; b. Betzah 11b, 15b, 21b, 23a; b. Mo'ed Qat. 18a; b. Yevam. 16a, 62a; b. Ketub. 10b, 39a, 42a; b. Sotah 25a; b. Git. 6b, 28b, 70a (2x); b. B. Bat. 147a; b. Sanh. 11b, 37b, 88a; b. Mak. 19a, 23a (2x); b. Zevah. 64a; b. Menah. 29a; b. Nid. 51a. *Lists of four:* b. Ber. 50b; b. Eruv. 17a; b. Pesah. 111a, 112b; b. Sukkah 29a (4x); b. Rosh Hash. 16b, 18b; b. Shabb. 23a; b. B. Qam. 4a, 4b, 26a, 26b, 53b, 55b (2x), 84a; b. Sotah 42b; b. Nid. 8a (only Soncino Print), 16b, 17a (only Ms. Vatican 111); b. Me'il. 15b (2x). *Lists of five:* b. Shabb. 129b; b. Betzah 39a; b. Ber. 10a,

the maxims are in Hebrew and not in Aramaic may point to an archaizing feature or an early date. At least in the case of sayings using *hapax legomena*, we may surmise that they reflect somewhat older material. Indeed, although these maxims are quite similar to each other in makeup, it does not seem that they are all products of just one author or stem from a single compilation, since they are also found in the five talmudic tractates that differ from the other tractates in their use of technical language (b. Ned.; b. Naz.; b. Me'il.; b. Ker.; b. Tamid). The sayings seem, therefore, to have been part of an established genre, rather than the signature style of a certain author. Here is an example of an agglutination of such maxims in tractate Gittin:

> **Three things** wither the strength[12] of man, and they are these: fear, the road [i.e., travelling], and sin.
> Fear, as it is written: "My heart is palpitating, my strength has left me" (Ps. 38:11); travelling, as it is written: "On the way my strength..." (Ps. 102:24); sin, as it is written: "My strength wavered because of my iniquities" (Ps. 31:11).

> **Three things** tear down the body of man, and they are these: eating while standing, drinking while standing, and having intercourse while standing.

> **Five** draw [man] closer to death than to life, and these are they: to eat and to stand up [immediately]; to drink and to stand up [immediately]; to sleep and to stand up [immediately]; to let blood and to stand up [immediately]; to have intercourse and to stand up [immediately].

> **Six** – the one who does them will die immediately: One who comes back from a journey exhausted, lets blood, enters the bathhouse, drinks and becomes intoxicated, sleeps on the ground, and has intercourse.

> **Eight things** are harmful in abundance but beneficial in moderation, and they are these: travel, "the way of the world" [i.e., conjugal relations], wealth,[13] labor, wine, sleep, warmth, and bloodletting.

12b, 27a, 56b; b. Pesah. 76b, 77b, 112a, 113b, 118a; b. Yoma 18a, 21b (2x), 83b; b. Betzah 3b, 32b; b. Ta'an. 26a, 28b; b. Hag. 13a; b. Git. 70a; b. B. Qam. 82a, 83b, 85a, 91a; b. B. Bat. 145a; b. Avod Zar. 17b; b. Hor. 13b; b. Ker. 16a. *Lists of six:* b. Ber. 10b, 43b, 44b, 51a, 57b (2x); b. Pesah. 55b; b. Pesah. 49b, 56a (2x), 113b; b. Shabb. 77a, 127a; b. Hag. 16a (2x); b. Yevam. 81b; b. Naz. 52a (2x); b. Git. 70a, 70b. Avod. Zar. 29a; b. Zevah. 2b, 46b, 72b; b. Menah. 71a, 104a; b. Hul. 104b. *Lists of seven:* b. Pesah. 54a, 54b, 112a; b. Shevu. 8a; b. Ketub. 109a (3x); b. Ned. 39b; b. Sotah 15a; b. Ker. 26a (only Venice Print and Mss.); b. Menah. 51b, 73b; b. Arakh. 16a. *Lists of eight:* b. Git. 70a (2x); b. Tem. 28b. *Lists of ten:* b. Ber. 51a, 55a, 57b; b. Hag. 12a; b. Yoma 23a; b. Pesah. 54a; b. Shabb. 81a; b. B. Bat. 10a; b. B. Qam. 82a (ten regulations of Ezra); b. B. Qam. 82b; b. Hor. 13b; b. Avod. Zar. 29a; b. Qidd. 82a; b. Arakh. 32b; b. Tamid 31b.

12 Ms. Munich 95 reads "the body," as in the next numerical saying.

Eight things diminish the semen, and they are these: salt, hunger, to be "torn,"[14] crying, sleeping on the ground, *gadgadnyut*,[15] dodder which is not in due season, and blood-letting below is like doing it two times. (b. Git. 70a)[16]

The array of subjects treated in these numerical sayings is very wide, as the above examples and those in tractate Berakhot demonstrate. They address decency (e.g., "Three things about the correct behavior in the privy," b. Ber. 62a); prolongation of life (e.g., b. Ber 42a, or b. Git. 70a above); theology (e.g., "Three things that God prompts," b. Ber. 62a, or: "Three things that make heaven recall one's sin," b. Ber. 54); and social interactions (e.g., "Three people who need protection," b. Ber. 54b). The maxims, with their style and content, were obviously appealing beyond Talmudic times. Several anthologies have been transmitted that include these lists (sometimes in a modified form) together with other prominent proverbs from the Talmud and other rabbinic literature.[17] Fragments of such anthologies have been found in the Cairo Genizah.[18]

Scholars have concluded that the purpose of the maxim lays in the realm of mnemotechnics.[19] This claim is reinforced by the observation that the maxims hardly move beyond numbers that can be counted on one's fingers.[20] Still, the large number in which they appear reduces their value as mnemotechnical devices (i.e., 54 maxims alone on "threes"). This does not mean to say that people did not know some by heart — the example below in which such a maxim is used as proof may reflect such an instance of memorization. Or, alternatively, may hint at the systematic organization of maxims (these and others) according to topic from where suitable proof could be retrieved. At least, the large number of numerical maxims indicates that their form was considerably popular.

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13 This is missing in Ms. Munich 95, which thus only enumerates seven of the eight.

14 נתק; the same root was used several times in the preceding maxims in the formula "seized and torn."

15 גדגדניות; *hapax legomenon*, maybe cherries. See Josephus 1834, 42.

16 Unless otherwise noted, the translations are mine and follow Ms. Munich 95.

17 See Lehmhaus 2015, 66–83, for a discussion of the structure of three 9th-century Midrashim consisting entirely of lists of such numerical sayings, i.e., the Midrash Ma'asseh Torah-tradition: Ḥuppat Eliyahu (The Canopy of Elijah), Midrash Shloshah ve-'arba' (Midrash of 'Three and Four'), and Pirqe Rabbenu Ha-Qaddosh (Lectures of Our Holy Teacher). The works "can most likely be dated to the 9th century" (Lehmhaus 2015, 71). See Judith Olszowy-Schlanger 2014, 26 n. 2, for a summary of the texts' history and editions.

18 See Olszowy-Schlanger 2014, 28.

19 Towner 1973, 4, also cited in Lehmhaus, 2015, 83. See also Valler, 1995, 184; Pasternak/ Yona, 2016, 244; Olszowy-Schlanger 2014, 27.

20 The use of fingers for counting is mentioned in b. Yoma 22a/b; see Executive Committee of the Editorial Board/Levias, 1906.

> Cabbage for sustenance and beet for health [=quote from the baraita]. Is then cabbage only for sustenance and not for healing? Was it not taught: "Six things *heal a sick person from his disease and his health will be 'healthy,' and they are these: cabbage, water from bran, honey, maw/rennet, keeping the law, and the large lobe of the liver."* This is to say that cabbage, like beet, is beneficial and not only good for a meal! (b. Ber. 44b)[21]

That the sayings were remembered and quoted may have been at least part of the intention of their original authors. We can assume that ancient creative minds felt the same pleasure as we do today when their creations "went viral," i.e., were quoted by others, or appeared scribbled on a public wall. However, the sheer ubiquity of these maxims, and their controversial content, which is, as in the above example, even in the Talmud often disputed and supplemented by some commentary, prevents us from drawing a straightforward conclusion regarding memorization. Although memorization remains a possible incentive for the creation/emergence of a numerical maxim, the conclusion has been, perhaps, too quickly drawn.

Although they are creative and even ingenious, talmudic numerical maxims obviously focus less on poetic style than did those in biblical and other Ancient Near Eastern literature, and more on packing content into the format of the numbered list.[22] They look less like neat literary creations and more like a display of knowledge, such as structured notes taken while reading, or a spontaneous creation made while musing. By investigating the different factors that might have originally helped generate these maxims, I would like to show that late-antique knowledge construction had various causes, which were neither more straightforward (i.e., to teach students), nor less complicated, biased, and selfish, than factors involved in contemporary knowledge construction, despite the different contexts.

The focus on pedagogical relevance alone ignores that the artistry of literary communication is driven by public attention. In addition, the numerical maxims seem too ingenious for the classroom alone.[23] This is particularly evident in their expression of the idea that everything can be pressed into, and conveyed by, numbers and letters, that is, the signs of the Hebrew alphabet. As will be shown, numerological structures were conceived of as inherent in every matter, with the intellectual challenge consisting in finding and understanding these

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21 Translation follows Ms. Munich 95. In the second cent. BCE through the first cent. CE, cabbage, *brassica*, was highly esteemed, e.g., Cato the Elder's "Praise of the Cabbage" in *On Agriculture*, 156–157.

22 See Pasternak/Yona 2016, 244.

23 See Helmut Krasser 2019, 159–174.

correspondences: an often unattributed and unconscious Pythagorean idea. The production of such an intellectual project necessitates time and certain intellectual predispositions and ambitions. These aspects will be addressed in the reminder of this paper.

The Talmud is not descriptive literature but, rather, an elaborate compilation of previously constructed knowledge. Clues for understanding the actual social setting, the intellectual views and educational principles, that gave birth to the texts collected in the Talmud have to be deduced from the broader geographical and chronological surroundings. Subsequent comparison will then show to what extent the clues gained from cultural contexts in the Roman Empire may be applied to the rabbinic setting in Sasanid Mesopotamia, if indeed we were to place the origin of the Hebrew maxims into the latter geographical context.

2 Social Incentives: Erudition and Competition – Some Scenarios

Riddles

The production of maxims requires some basic education, time, a material surface, and an incentive or occasion. Recent scholarship's consideration of data that included previously neglected or unavailable traces of writing, such as graffiti and ostraca, showed that literacy was more widespread than previously assumed and penetrated social classes beyond the elites.[24] In particular, concise compositions, such as sayings, riddles, and jokes circulated and were sometimes even composed collaboratively on walls.[25] Some of the numerical maxims under discussion may indeed have been the result of such a group "chain enumeration," if we imagine a first person writing on a public wall, "Eight things diminish the semen," and maybe adding a first example. Passersby would then have continued the list.[26] At least the Palestinian Talmud mentions in one case information that was gathered from the wall in the house of a particular sage.[27]

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24 See Baird 2016; Benefiel 2012; Lougovaya 2018; Stern 2018, 141–168.

25 See Benefiel 2012.

26 Graffiti generally tended to accumulate and to interact thematically with each other, see Lohmann 2017, esp. 108–109.

27 See y. Kil. 1:1, 27a.

Maxims may have been the result of systematic summaries of texts and hence were dependent on a more formal workspace. Although we do not have direct evidence that "summarizing" was systematically taught by late-antique curricula, summarizing seems to have become the fashion, which is visible in the general "condensation of literature" in late antiquity.[28] Summaries of prior volumes, for example, became common in introductions (e.g., by the historians Polybius, Diodorus of Sicily, or Dionysius of Halicarnassus).[29] Aulus Gellius wrote summaries of the content of the very book that was to follow and thus provided a digest. Indeed, the first example in the above-quoted list from tractate Gittin seems to hint that some of the numerical maxims may have been summaries as this maxim extracts its information from the biblical text, which it references.

Some of the numerical maxims may have summarized sources that were not subject to talmudic exegesis and hence not worth quoting or referencing (as in "Rabbi X said..."). These sources may have presented knowledge similar to the content of the plays attributed to Euripides, e.g., fragment 907: "(Heracles) was eating green figs along with portions of oxflesh, howling unmusically enough for a barbarian to notice it;"[30] fragment 853: "There are three virtues you should practise, child: to honour the gods, the parents who begot you, and the common laws of Greece. If you do these things, you will always have good repute, the fairest of crowns;"[31] and fragment 906: "Cold is most hostile to a delicate skin."[32] Such information can easily be contracted and listed numerically. Yet, as in the example of continuing another's musings on walls, the creation of numerical sayings may often have been a more playful and sociable activity than the production of summaries in seclusion. Indeed, as Laura Lieber pointed out after an analysis of late-antique Jewish Aramaic poetry, the "consideration of performance can and should be applied more widely."[33]

Ausonius's *Riddle of the Number Three* (*Griphus ternarii numeri*) presents an appealing case for comparison within the genre of "wisdom cast in numbers" and writes the following about the occasion that stimulated his writing:

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28 On the phenomenon of condensation in late antiquity, see Dusil/Schwedler/Schwitter 2017, 1–22.

29 See Jacob 2000, 107.

30 Euripides 2009, 504–505.

31 Euripides 2009, 478-479.

32 Euripides 2009, 502–503.

33 Lieber 2014, 563.

The occasion of this bit of foolery was as follows. When I was on active service — a season which, as you know, is one of military freedom — at my mess a challenge was issued to drink, not in Greek fashion — as at the banquet of Rubrius, but after the manner described by Flaccus in that piece of his where by reason of "midnight" and the "new moon" and "Muraena's augurship" "the bard inspired calls for thrice three cups." At this subject of the triple number that poetic itch (*poetica scabies*) of mine at once began scratching away… (Ausonius, *A Riddle of the Number Three,* prologue)[34]

The military campaign to which Ausonius refers might have been the one against the Alamanni (368/9).[35] The immediate occasion to write the little booklet on the number three, however, had been a drinking game.[36] Ausonius's poem consists of a "thrice triple tenfold" of lines and enumerates things that come in threes, making use of poetic license and a number of self-quotations.[37] The poem uses hexameter, a meter divisible by three and, of course, six:[38]

Everything follows that law of three, or three threes:

The shaping of a man, his full gestation period,
And his life-span's final end at nine times nine years. (*Riddle*, lines 4–6)[39]

Although Ausonius's composition is called *Gryphos* (Riddle), there is nothing left to be solved for the audience: Ausonius has already completed the task and found the number three wherever it appears in his surroundings. The sympotic *Aenigmata* (Riddles) by a certain Symphosius differ in that regard from the *Gyrphos* but share a considerable amount of numerical and other features with the latter.[40] Both works and authors embrace the symposium and especially drinking as their creative stimulus.[41] And like the *Gryphos*, the *Aenigmata* favor the number three through the choice of three hexameters, or multiples of three, per

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34 Ausonius, trans. Evelyn White 1919, 354–355.

35 See Lowe, 2013, 338.

36 "And that you may know me for a boaster — I began these bits of verses during tiffin and finished them before messtime, that is to say, (again)." Ausonius, trans. Evelyn White 1919, 355–357 (prologue).

37 Lowe 2013, 343–344.

38 Lowe 2013, 342.

39 Translated by Lowe 2013, 335.

40 On the question of whether the attribution *symphosii* refers to a person or to the locus of the riddles, or maybe even to both (with the name's being a pun to the latter), see Leary 2015, 1–2. The composition is most likely to be dated to the late-fourth/early-fifth century (ibid. 4).

41 These claims might also have been influenced by Martial, who clearly influenced both the *Gryphos* and the *Aenigmata*, see Leary 2015, 6.

riddle.[42] Yet, although Symphosius's riddles ask to be answered, one of his habits distinguishes his composition from contemporary puzzle books: he renders the solution to the riddle as its lemma. This rendering of the solution as a title probably aimed at provoking a reaction in the reader, that is, to stimulate their admiration for the cleverness of the composer, an intention that Ausonius's "riddle" seems to share.[43] A similar game with the audience appears to be at play in the talmudic numerical maxims as well. The audience is first informed about what is to come and is given a short amount of time to start thinking about the topic on their own — just enough to be deeply impressed by the speed with which the riddler then adds the solution. Although the members of the audience did not have sufficient time to devise a decent solution themselves, they could assess and determine whether the riddler was to be admired or criticized, or both.

Yet, the social contexts of riddles involved not only performance, but also the exchange of parting gifts (*apophoreta*) by lottery at banquets, for example. The tickets (*pittacia*) may have contained a poetic description of the gift to be received — some of Martial's epigrams (books 13 and 14) seem to render the content of such tickets. Sometimes, the guests also had to guess the gift based on the description.[44] Petronius (56.7–10) preserves a funny version of this tradition, in which the ticket seemed to refer to a traditional gift but then turned out to be just a pun for the real one.[45] In a different context, such ticket-slats were used by pilgrims at Christian shrines to ask questions and receive oracular answers.[46] *Pittacia* (פיתקא), in the sense of small, very thin wooden slats, are also mentioned in the Talmud.[47] The numerical sayings on such slats could easily be imagined as little riddling summaries of gifts, dedicatory notes, or "cheat sheets."

Intellectual Games

Another platform for riddles and maxims were symposia like, for example, the one in honor of the Roman festival Saturnalia. At symposia, riddles were used in

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42 For a summary of parallels between the two works, and for the reference, see Leary 2015, 5.

43 See Leary 2015, 12–13; and further Sebo 2012, 184–195, and esp. 192–195, for references to examples of riddles with multiple or additional solutions.

44 See Leary 2015, 9.

45 See Ullman 1941.

46 See Luijendijk 2014, 49–50.

47 E.g., b. Sanh. 26a, 96b; b. Bekh. 8b; b. B. Metz. 86a; b. Sanh. 64a; b. Yoma 69b; b. Hor. 13b.

the context of intellectual challenges. Gellius provides a nice account of the procedure of such intellectual games:

> *The kinds of questions we used to discuss when spending the Saturnalia at Athens; and some amusing sophistries and riddles.*
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> We used to spend the Saturnalia at Athens very merrily yet temperately, not "relaxing our minds," as the saying is — for, as Musonius asserts, to relax the mind is like losing it — but diverting our minds a little and relieving them by the delights of pleasant and improving conversation. Accordingly, a number of us Romans who had come to Greece, and who attended the same lectures and devoted ourselves to the same teachers, met at the same dinner-table. Then the one who was giving the entertainment in his turn, offered as a prize for solving a problem in the work of some old Greek or Roman writer and a crown woven from laurel, and put to us as many questions as there were guests present. But when he had put them all, the question which each was to discuss and the order of speaking were determined by lot. Then, when a question was correctly answered, the reward was a crown and a prize; if it was not correctly answered, it was passed on to the next in the allotment, and this process was repeated throughout the circle. If no one could answer a particular question, the crown was dedicated to the god in whose honour the festival was held. Now the questions that were proposed were of this kind: an obscure saying of some early poet, amusing rather than perplexing; some point in ancient history; the correction of some tenet of philosophy which was commonly misinterpreted, the solution of some sophistical catch, the investigation of a rare and unusual word, or of an obscure use of the tense of a verb of plain meaning. (*Attic Nights* 18.2.1–6)[48]

Other sources report that those who lost at such intellectual games had to drink wine mixed with saltwater or perform sconcing (excessive drinking).[49] The pressure seems to have been quite high, and guests are described as having resorted to hiding notes in their garments to avoid public embarrassment.[50]

Although Symphosius's riddles for the symposium have a completely different form than the talmudic numerical maxims, they share their outlook. Thus, like the maxims, the *Aenigmata* show an "erudite concern ... with word

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48 Aulus Gellius, trans. Rolfe 1927, 296–299, slightly adapted. In the sequel, Gellius offers seven such questions.

49 Leary 2015, 10 and n. 72 for references.

50 E.g., Lucian, *On Salaried Posts*, 27. The term used for "note" here is γραμματίδια, "small tablet," "memorandum,"; see Liddell/Scott 1968, s.v. γραμμᾰτείδιον. Since such games could challenge the integrity of guests, Suetonius writes approvingly of Ceasar Augustus, "He gave dinner parties frequently, but they were always formal and showed great regard for social status and the individuals concerned. [...] For he would encourage the silent or those who talked quietly to share in the general conversation. He would intersperse entertainments and actors or even street-players from the circus and more frequently story-tellers" (*Vita divi Augusti* 74). Translation follows Suetonius, trans. Wardle 2014, 68.

play and etymology, their literary debts and the astronomical, mythological, geographical, medicinal and botanical knowledge they display."[51] The numerical sayings in the Talmud could, in fact, have started out as riddles in need of completion by attendees at a symposium. We could even imagine a die involved in the determination of the number of items to be enumerated. Throughout late antiquity, not only dinner parties occasioned by festivals, but also gatherings more generally, could serve as platforms for agonistic displays of knowledge, whether anticipated or spontaneously.[52] Philostratus (2nd to 3rd century CE), for example, "describes a sympotic group known as the *Klepsydrion* (the 'water-clock group'), a selection of ten "star pupils" who would gather to listen to Herodes Atticus offer his interpretations of 100 lines of poetry during a period limited by a water-clock."[53]

The *skolion* — or variants thereof — is a noteworthy game that can quite easily be imagined having stimulated numerical verses. The meaning of the term *skolion* is not entirely clear, but it has been related to both σκολιός, "crooked," and δύσκολος/δυσκολία, which could refer to "difficult" as well as "riddling."[54] The tenth-century Byzantine encyclopedia *Suda* notes the following about the *skolion* game: "*Skolion*: the drinking song, as Dicaearchus says in his *On Musical Contests*, because there were three types of songs: one was sung by all, another by each person one after the other, a third by the most educated since the order was random. It is called *skolion* (because of the order)."[55] The second and third variant of this game seem to be the most interesting for the present purpose, since the song was composed on the spot by the symposiasts, who took turns, each trying to cap the previous contribution. Thus, we can imagine a game like the *skolion* — maybe sung, maybe not — being started with someone calling "x 'things' that do/are...". Participants were challenged to think of a suitable "thing" until the number x was completed. A servant or student may have been instructed to write noteworthy outcomes down. Imagined as such a *skolion* game, a numerical maxim may have come about like this (talmudic text in italics):

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51 Leary 2015, 12. On the encyclopedic outlook of Macrobius's symposiac work, see Olmos 2012.

52 Krasser 2019, 159–160, traces the emergence of the literary agon back to the early Empire. See also Krasser 2005, 374.

53 *Lives of the Sophists*, 2.10, 585–586; see König 2012, 16.

54 See Collins 2004.

55 Collins 2004. Indeed, the fact that the song was composed spontaneously obviously contributed to its being crooked (Scholia Aristoph., *Wasps*, 1222).

> *The gamemaster calls the game: "Three whom the Holy One, Blessed Be He, proclaims every day:"*
>
> First participant (who happened to be a bachelor): *The bachelor who walks around in a city and does not sin!* (Laughter in the audience and cheers.)
> Second participant, sitting right next to him (a first-time attendee who was invited spontaneously upon returning the host's missing lamb): *The poor person who returns a lost item to its owner!* (People clap, one calls out the host and shouts, "Give him money!")
> Third person in the row: *The rich person who tithes his produce in secret!* (Awkward silence until someone says: "Wow, you just spoiled *your* proclamation in heaven!" Laughter.)

Similar contexts can be imagined for the following two rounds of the game. Since someone had been assigned to record the answers, the playful setting produced a total of three clever maxims. These are the other two:

> Three [whom] the Holy One, Blessed Be He, loves: The one who does not get angry; the one who does not get drunk; and the one who does not insist in his principles.

> Three [whom] the Holy One, Blessed Be He, hates: The one who says something different with his mouth and something different in his heart; the one who knows of evidence in favor of his friend and does not testify on his behalf; the one who sees something shameful in his friend and testifies alone against him. (b. Pesah. 113a/b)

Athenaeus describes a game called *gryphos* (γρῖφος), perhaps the one that inspired the title of Ausonius's poem. It was yet another game designed to test the knowledge and grammatical aptitude of the guests. Like the *skolion*, the *gryphos* could take different forms. It could request that participants name words starting with, or omitting, a given letter; that they would find names that did or did not contain the name of a particular or any god; or to state words starting or ending with a given syllable. Yet, a *gryphos* could also be a quiz testing the player's versatility in adapting meter, answering questions about literature or grammar, or solving riddles.[56] Here, we could again imagine that contestants had to enumerate a requested number of "things" that do/are a certain something.

In sum, we see that a lot of learned and creative work was going on at dinner parties or in intellectual associations such as the *Klepsydrion*. It seems not unwarranted to place the talmudic numerical maxims within the setting of a banquet or gathering. Not only is their scope very broad, covering all kinds of topics that may come up on such occasions and by different people, but they also build on each other, taking a starting point and evolving from there.

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56 See Luz 2010, 139–146, for a discussion and examples.

A Playful Talmud?

As I argue elsewhere at some length, the Talmud is arranged like a symposiac work, that is, it presents the listener/reader with a symposiac setting into which they are drawn as silent (or not-so-silent) participants.[57] The intellectual activity of discussion and argument-building, the presentation of knowledge, and engagement with the insights of others is thereby placed at the center and set before the audience as a model for imitation. While the Talmud does not describe the gatherings that led to the composition of its content, it arranges the output of these gatherings, some of which was probably produced for or within symposiac settings, into an impeccable rhetorical discussion. Similarly, although the rabbinic movement is best explained as having emerged from organized associations that gradually became more uniform and institutionalized, we find only implicit evidence for such structures in the writings they left to posterity.[58]

The Mesopotamian plain was heavily influenced by Greco-Roman customs, due to its proximity and fluid border lines, but also on account of prior Seleucid rule. There is not, however, much archaeological proof of Judean life in Sasanid Mesopotamia. Arguments for symposiac and collective activity derived from the Greco-Roman context are corroborated by the fact that, from the first century onwards, there is increasing physical evidence for communal dining in synagogues, which, for this purpose, provided a kitchen and a *triclinium*.[59] "(M)eals," Lee I. Levine concludes, "were a familiar feature of ancient synagogue life. This was true of the diaspora as well as Palestine, and throughout all of Late Antiquity."[60] Moreover, as Gil Klein has pointed out, the architecture of a dining room, whether furnished in the old-fashioned Greek style (*andron*), which seated people against the walls of a square room, leaving an "arena-like structure with a

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57 See Amsler (forthcoming), chapter 1.

58 See Lapin 2012, esp. 64–97.

59 See Williams 2013, 165, and further references there. Persian or "oriental" symposiac traditions have been discussed by Burkert 1991; Eliav 2015, 165–172, albeit with a focus on the purported lavish aspects of symposia. In the wake of a general rectification of the economic system in late antiquity that focuses on the actual working force of society, i.e., the craftsmen, who organized themselves in associations, the elitist focus on the banquet needs to change as well: Not everyone, and not all associations, had the means to sponsor lavish meals. But such festivities nonetheless remained important for cohesion and trust within the group; see Venticinque 2016, esp. 99–132.

60 Levine 2005, 394, and see further 316–319 for references (mostly) from the Palestinian Talmud to such practices.

defined empty space at the center," or in the manner of the Roman *triclinium*, with its three couches facing each other in "a Pi-shaped (Π) arrangement," seems suited for rabbinic Torah study.[61] Given the Persian habit of using pillows rather than fixed furniture, one can imagine more flexible structures that would have been equally supportive of joint discussion, study, and intellectual games.[62]

There is, however, only rare, if distinct, evidence for sympotic activity among members of the rabbinic association. As Philip A. Harland and David Instone-Brewer have discussed, the structures of associations manifest themselves mostly in the organization of festive meals (pre-registration, seclusion) or distinct vocabulary with which fellow associates are addressed (e.g., *chaver*, colleague, associate).[63] Harland is certainly right that the talmudic discussion of certain passages from the Mishna show that measures suggested by the earlier work were no longer relevant. In other talmudic passages, however, we find that similar rulings were still issued in talmudic times. The order in which people should wash their hands at banquets, say grace, and open the meal, for example, is an issue of discussion (b. Ber. 46b–47a). Scattered clues describe occasions that could possibly give rise to a banquet: if a colleague recovered from a disease (b. Ber. 46a), if a student completed the study of a mishnaic tractate (b. Shabb. 118b–119a), or simply if one wanted to invite colleagues (b. Git. 55a).[64] Talmudic texts, therefore, clearly associate the banquet with the context of learning and other learned men with whom they shared tight bonds. Not surprisingly, then, the Talmud also cites a critique of those who abandon study in favor of banquets (b. Shabb. 151b).

Wine was clearly used to stimulate productivity and to turn gatherings into even more enjoyable moments. At least one story finds it quite feasible that a teacher would get so drunk with his students that, after their meeting, they needed a cure for their intoxication (b. Shabb. 66b).[65] Thus, whether the numerical maxims in question originated in Palestine or Babylonia, it remains feasible that at least some of them were the product of games played at leisurely gatherings in a private dining room between teachers and students or among equals, or that they resulted from officially organized dinners according to the habits of

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61 Klein 2012, 332.

62 On Persian interior furnishing, see Simpson 2015, 15.

63 See Harland/Instone-Brewer 2008. It is interesting to note here that agricultural managers in Kellis refer to their fellow managers as "brothers" (*adelphoi*); see Bagnall/Hope 1997, 70.

64 The Aramaic terms for festive days or banquets are יומא טבא and סעודתא.

65 Knowledge about wine was quite substantial (e.g., b. Git. 70a), although Babylonia seems to have favored beer; see Rosenblum 2020, esp. 180–182.

associations. Games, it has been amply pointed out, contributed, and continue to contribute, to the stability and cohesion of societies in general and of smaller groups.[66]

Late antiquity perceived learning and playing games or adulthood and playing as much less of a dichotomy than they appear today.[67] Even physical games or games with objects such as ball games, wrestling, hide-and-seek, or knucklebones remained a part of adult entertainment.[68] Like physical games, intellectual games were an occasion to divert the mind, to show off, and build social reputation with wit and knowledge.[69] Such games caused people to be prepared with a stock of maxims, riddles, and jokes, which thus travelled widely. A wall in Pompeii apparently prompted the guests of the house to write something memorable — a sort of an intellectual guest book.[70] Much more than a serious activity like, for example, the creation of a teacher for his students, the numerical maxims may have risen out of such playful contexts or were crafted in preparation for them. They have the potential to display the erudition of their author by combining quick-wittedness with common knowledge. Additionally, the structure reveals also certain algorithmic competences and insights. These will be the subject of the next section.

3 Intellectual Mannerism: Numerology

In the Greek, Hebrew, Aramaic, and Syriac alphabets, letters also carried numerical values. Consequently, the semantic and numeric value of letters were intrinsically entwined: words could also be read as numbers. This implied that, "People who were literate were as a rule also numerate," which, to some extent, included their ability "to perform the basic arithmetical operations."[71] This seems even more true for people who used the talmudic numerical system,

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66 See Schwartz 2010, 641–642, and further references there.

67 Although in many ways outdated and racist, the work of Ariès 1996, 60–97, demonstrates this quite nicely.

68 On such physical games in and out of rabbinic literature, see the overview article by Schwartz 2010.

69 Similarly, lighthearted games of divination are a more recent appropriation, dating to the end of the fifteenth century. In late antiquity, they are used as an earnest means for finding answers to pressing questions; see Luijendijk 2014, 8 and n. 31.

70 See Benefiel 2012, 68.

71 Cuomo 1998, 46. Mathematical knowledge pops up repeatedly for exegetical purposes (48–51). On the simultaneous study of letters and numbers, see, further, Cribiore 2001, 181.

which, after reaching 400 with the last letter (*tav*), combines numbers to move beyond 400, thereby imposing arithmetic competences (e.g., 500 = 400 + 100). Playful or strategic ciphers alike were often based on the exchange of letters that together added up to a certain number.[72]

The people who composed the talmudic maxims under discussion may have enjoyed an education that went beyond the stage of basic alphabetization and "numeralization." Advanced education, however, did not diminish the sense of an intrinsic connection between the numeric and semantic value of letters. To the contrary: the more advanced students were, the more they became aware of these conflating values. The engagement with the subject was prevalent throughout late antiquity: numerology was not a distinct, liminal theory, but a broad one, applicable to many different subjects. The virtue of a "broader explanation" renders such theories likely to enter the common sense of their time.[73]

This sweeping persuasiveness of numerical structures is also confirmed by Latin authors, whose numerical system involved only, or, rather, precisely, seven letters. The importance of numbers in the writings of Roman authors is mostly due to the prevalence of Stoic thought among the Roman elite because of its emphasis on public and private duty.[74] In Stoic thought, numbers constitute the most fundamental "bricks of the universe," since not even a god can change the fact that 2 x 10 equals 20.[75] Ausonius had made the connection between number and his physical surroundings ("nature" in the modern paradigm), but also between number and language, the subject of his *Riddle of the Number Three*. Other authors also used such numerical arrangements, but in less obvious ways. Symmachus, the recipient of Ausonius's riddle, seems to have intended to compose a seven-book letter collection.[76] Therein, he may have followed Varro's example of the *Hebdomades*, a collection of 700 painted portraits of famous people, each appended with an epigram.[77] Varro, in fact, wrote a now-lost treatise entitled *On the Beginnings of Numbers* (*De principiis numerorum*). Ausonius refers to this work in his introduction as among the things "the uninitiated herd wots not of."[78] In an epitome of the introduction to the *Hebdomades* preserved in Gellius's *Attic Nights*, Varro highlights the importance of

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72 Paz/Weiss, 2015.

73 Lehoux 2012, 176–199, esp. 192.

74 Beagon 1992, 27.

75 Beagon 1992, 29 n. 7.

76 Sogno 2017, esp. 181–182.

77 Salzman 2018, 92–93, and see Pliny, *NH* 35, 2.11.

78 Ausonius, trans. Evelyn White 1919, 356–357.

the number seven in cosmological correlations, down to human gestation periods and critical days in the course of a disease.[79] Along with similar cosmological information, scholars have also observed numerical arrangements within talmudic lists of arguments or as underlying literary devices.[80] The privileged numbers are mostly congruent with those used in the numerical maxims, namely three, four, five, seven, ten, and fourteen (i.e., 2x7).

Exegetes used numerology to interpret numbers in their base texts, be they the Bible or Plato. Philo of Alexandria, for instance, employed it to explain underlying numerical structures in the Bible. For him, the method is so evident that he thinks Moses must have used it, too:

> They [the animals permitted for consumption according to Deut. 14:4] are the calf, the lamb, the kid, the hart, the gazelle, the buffalo, the wild goat, the pygarg, the antelope, and the giraffe, ten in all. For as he [Moses] always adhered to the principle of numerical science (ἀριθμητικῆς θεωρίας), which he knew by close observance to be a paramount factor in all that exists, he never enacted any law great or small without calling to his aid and as it were accommodating in his enactment its appropriate number. But from all the numbers from the unit (μονάδος) upwards ten is the most perfect, and, as Moses says, most holy and sacred, and with this he seals his list of clean animals when he wishes to appoint them for the use of members of his commonwealth. (*On Special Laws* 4.18)[81]

In other instances, Philo used numerology to interpret actual numbers that appear in the text, such as the seven days of creation, the forty days of the flood, and so on.[82] This concern was also shared by Christian exegetes such as Augustine and the Syriac author Gabriel Qatraya.[83] The latter wrote a commentary on the Liturgical Offices (around 600 CE in present-day Qatar) in which he made use of Pythagoras's number science to explain the perfect creation by the perfect creator:[84]

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79 *Attic Nights* 3.10, 1–17. Similarly, see Macrobius in his commentary on the *Dream of Scipio*; see Lehoux 2012, 190–191.

80 See Simon-Shoshan 2008, and, on numerical structures, e.g., Jacobs 1983; Pasternak/Yona 2017; Valler 1995. A hemerology preserved in tractate Shabbat 129b is a good example of the correlation between a particular action and the auspiciousness of the day as a number in the week or the month (e.g., On the first day of the week do not do X). A section on astrology in b. Shabb. 156a-b is obviously crafted around the numbers seven and three; see Rubenstein 2007, 118.

81 Philo, trans. Colson 1939, 70–73.

82 See Cuomo 2001, 180–181, and 250.

83 E.g., Augustine *De doctrina christiana* 2.16.25, and Cuomo 2001, 251–254.

84 Brock 2014, 155.

He defines everything by number, and by means of certain numerical symbols he used to transmit the mystery/secret of his teaching to his disciples … He handed down that the number one is the equivalent of the Maker, whom he in truth confesses as being one. The number two (symbolizes) matter, and three species, and four the elements, providing four equivalents. And just as the numbers 1, 2, 3 and 4 make up the number 10, so, by the power of the Creator, who is one in the simplicity of his nature, this whole world came into being with the number of the elements and the (full) number of its natural constituents (lit. natures), bearing the equivalence of the perfect number of ten.[85]

Pythagorean ideas similarly seem to have influenced rabbinic hermeneutics, which, although revolving around the most frequently used numbers in the Hebrew Bible, become increasingly conscious of their mathematical qualities. The analysis of the numerical value of words (Gematria/Isopsephy) and number symbolism ultimately became part of the catalogue of the thirty-two hermeneutic rules by Rabbi Jose the Galilean.[86]

The reason behind this preoccupation with numbers was not just the entanglement of number and letter. Rather, these authors drew on a concept of numbers that differed considerably from the modern one, which treats numbers exclusively as quantitative entities.[87] For late-antique mathematicians such as Boethius, Nikomachos of Gerasa, Philoponos, and Neoplatonist thinkers, by contrast, numbers were compounds of units adding up to even or uneven numbers.[88] In this system, three was considered to be the first actual number, since one (the monad) is not a composite, and two (the dyad) is a composite of two monades.[89] The resulting quantitative numbers were seen as only the reflection of the intelligible numbers through which "the One"/God created the world.[90] They are therefore inherent in the creation, just like the four seasons, the five elements (including ether), or the seven vowels and planets (the latter number including the sun and the moon). Ten was considered the perfect number be-

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85 Brock 2014, 162. Brock further notes that, "A Discourse by Pythagoras and a collection of his sayings in Syriac translations are known from other sources, but Gabriel must have derived this information from somewhere different" Brock 2014, 162).

86 See Executive Committee of the Editorial Board/Levias 1906.

87 See Heilmann 2007, 140.

88 See Heilmann 2007, 130–131.

89 See Heilmann 2007, 134. Moreover, in Pythagorean thought, the dyad was considered to be a number that challenged the uniqueness and goodness of "the One"; see Kate Hobgood (undated), Pythagoras and the Mystery of Numbers, accessed under http://jwilson.coe.uga.edu/EMAT6680Fa06/Hobgood/Pythagoras.html, February 6, 2023.

90 Heilmann 2007, 136–137, 140. The most direct reflection of these intelligible numbers was considered to be the soul, which is why the study of the *quadrivium* begins with an examination of the soul (Heilmann 2007, 143).

cause 4+3+2+1=10.[91] More individual interpretations were also possible. Thus, Iamblichus described the number five as the fulcrum of a balance, with numbers 1–4 on one side and numbers 6–9 on the other.[92] Julius Africanus extols the numbers 6 and 4.[93] Africanus further used pentagons, and probably also hexagons, with pictures and musical notations, from which one could infer ingredients for his medical recipes.[94] Here, geometry and harmony are distinctly linked to therapy. Late-ancient mathematics was essentially a study in the "harmonic faculty" of the cosmos.[95]

These considerations shed a different light on the use of numbers in the numerical maxims under investigation. The numbers were likely used not just for enumeration or summary; they also point to an intrinsic connection between the threes, fives, eights, and so on. Organizing principles according to number instead of subject can be observed in compilations of sayings such as Mishna tractate Avot or the Pirqa de-Rabbenu ha-Qadosh.[96] The categorization according to number reveals the cosmological connection of and between these subjects, just as do the threes in Ausonius's Riddle.

4 Essential Factors: Space and Leisure

I would like to end this paper about factors that may have contributed to the creation of numerical maxims now found in the Talmud by considering first the geographical, and finally the temporal space in which adult learning took place. This will provide a platform to address issues connected to learning that will further help situate the numerical maxims within a learning culture that was, in many ways, different from ours. For example, we tend to focus on the urban space as the driving force behind intellectual creativity. Surely, we reason, the density of intellectuals in a city provided more opportunities to network and to increase the audience for one's ideas.[97] Just because cities hosted some famous

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91 See Hunger 1978, 222–223.
92 Theologia Arithmetica 35.6ff; see Cuomo 2001, 254 n. 19.
93 See Cesti 24–25.
94 See Africanus, trans. Wallraff/Scardino/Mecella/Guignard/Adler 2012, XXX–XXXI. For examples of such recipes see, e.g., F12, 45, Seventh Cestus or F12, 5, Seventh Cestus.
95 See Nathan Sidoli 2014, 17 n. 8.
96 See Executive Committee of the Editorial Board/Levias 1906, "Numbers and Numerals;" and Olszowy-Schlanger 2014, respectively.
97 See Stenger 2019, 6–11.

schools, however, does not mean that the countryside was inhabited by illit-erate ignoramuses.[98] Recent excavations in rural Egypt, for example, have pointed to a rich culture of learning.[99] Rather than as a peripheral space where, occasionally and rather accidentally, a bit of learning occurred or a piece of knowledge ended up, I suggest seeing the countryside as an equal partner in knowledge production. This approach can be justified if we look, for example, at mathematics.

Contrary to ancient mathematics, which appears primarily theoretical, late-antique mathematics becomes mostly feasible to us as implemented: sophisti-cated bookkeeping records from big estates attest to the work of meticulous accountants; complicated tax systems necessitated land surveyors who were well-versed in geometry, as they measured, counted, calculated, and projected the harvest.[100] Mathematical capability was clearly needed in the countryside, by owners of estates but even more so by those whom they employed, and by self-employed farmers and craftsmen. The mathematics used in the Talmud similarly exhibits applied mathematical knowledge that draws mostly from planimetry, stereometry, and (applied) arithmetic operation.[101] No matter where we situate the rabbinic scholars in Babylonia, whether in the megalopolis of the Sasanid capital Ctesiphon (Mahoza), in smaller towns such as Sura or Pumbedi-ta, or in one of the above-mentioned villages, they had to be in a position to carry out appropriate mathematical operations.[102] This was probably even more true in rural areas, since it was harder to procure a specialist.

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98 This idea seems to have been imported into the study of history via its conflation with anthropology and a distinct evolutionary paradigm of civilization. Cohn 1980, 203–205, points to a way of analyzing areas starting in the 1930s that framed the indigenuous village as a primordial "bound entity" vis-à-vis the modern and progressive city. "The village was not only the site of 'the before' in terms of its 'backwardness,' but the assumed locus of the traditional civilization, practices and beliefs" (Cohn 1980, 205).

99 E.g., Kellis in the Dakhleh Oasis or Tebtunis; see Bagnall 2018 and Hanson 2005, respective-ly. Many of the highly sophisticated papyri collected under the name of Papyri Graecae Magi-cae have similarly been found in rural spaces.

100 See Serafina Cuomo 2001, 212–218; for an example, see Rathbone 1991, 331–369.

101 Zuckermann 1878, 1. He further mentions that the decimal system is referred to in b. Bekh. 60a, and that b. Naz. 8b and b. B. Bat. 164b mention several geometrical figures also by their arithmetical value (idem. 1n1). Other examples include b. Pesah. 109a/b (the space people need in the *sukka*) or b. Eruv. 14a (Pi). The most exhaustive treatment of the issue is still Zucker-mann. Feldman 1913, relies heavily on Zuckermann. The subject would benefit from a more exhaustive research project in conversation with recent work on late-antique mathematics.

102 These villages often appear in connection to names, i.e., "Ravin from Nares" or "Rav Aha from Difti" (both in b. Git. 69b). Aharon Oppenheimer attempted to locate these places on the

The Talmud also participates in what might be termed "literary mathematics," that is, riddles describing a mathematical problem cast in "fictional situations" that were either "historical, mythological, or just everyday."[103] Some of these types of mathematical riddles, which may be "attributed to the fourth-century grammarian Metrodorus," have been collected in the *Palatine* (or *Greek Anthology*).[104] Here are two examples:

> Croesus the king dedicated six bowls weighing six minae [= 600 drachms] each one drachm heavier than the other.
> Solution: The weight of the first is 97 1/2 drachm, and so on.[105]

> Demochares lived for a quarter of his whole life as a boy, for a fifth part of it as a young man, and for a third as a man, and when he reached grey old age, he lived thirteen years more on the threshold of eld.
> Solution: He lived 15 years as a boy, 12 as a young man, 20 as a man, and 13 years as an old man; in all 60.[106]

The Talmud preserves similar problems that were adapted to the talmudic world and its protagonists.[107] For the less trained eye, they are not recognizable as mathematical riddles, but, rather, appear as puzzling, exaggerated stories, like the following example:

> Rav Pappa and Rav Huna the son of Rav Joshua once dined together, and Rav Pappa ate 4 times as much as Rav Huna .... On another occasion Rav Huna and Ravina dined together, and Ravina ate 8 times as much as Rav Huna. Then, said Rav Huna: "I would rather dine with 100 people like R. Pappa than with one Ravina." (b. Pesah. 89b)[108]
> Solution: After dining with 100 other guests eating like Rav Pappa, Huna and the other guests are charged for 401 helpings. Since there are 101 guests with Rav Huna, each one pays for 401/101. When dining with Ravina, Rav Huna's share costs 9/2.[109]

Mesopotamian map. According to him, Nares may be located in the "hilly district" southeast of Sura, while he was unable to identify Difti/Difte; see Aharon Oppenheimer 1983, 264, with map on 549, and 113 and esp. n. 12, respectively.

103 Cuomo 2001, 245.

104 See Cuomo 2001, 245.

105 Translated by Paton 1918, 33.

106 Translated by Paton 1918, 95.

107 E.g., in b. Avod. Zar. 9b, the instructions on how to calculate the Sabbatical year (attributed to R. Huna, son of R. Joshua); see Zuckermann 1878, 62–63, or Feldman 1931, 20, for more examples.

108 Translation follows Feldman 1931, 20.

109 See Zuckermann 1878, 50.

These mathematical problems may, again, have served as entertainment or for teaching purposes and maybe both, although it does not seem that teachers were concerned about the entertaining factor of their teaching. Much like the riddles, which these mathematical problems in fact are, the problems appear to have been used to intellectually challenge other learned men while also enjoying a decent meal together.

Placed in this setting, the following somewhat puzzling story appears to be a tricky mathematical riddle, which starts considerably easy with comparison and estimation and ends with a complicated punch line:

> Said Rabbi Yohanan, "Rabbi Ishmael the son of Yose's member was like a wineskin of nine *kav* [approximately five gallons]; Rabbi Elazar the son of Rabbi Shimon's member was like a wineskin of seven *kav*." Rav Pappa said, "Rabbi Yohanan's member was like a wineskin of three *kav*." And there are those who say: like a wineskin of five *kav*. Rav Pappa himself had a member which was like the baskets of Hipparenum. (b. B. Metz. 84b)[110]

The first two statements about the size of Rabbi Ishmael and Rabbi Elazar's member suggest that the member of the next Rabbi is again two *kav* smaller, which would result in five *kav* for Rabbi Yohanan's member. Alternatively, it may be four *kav* smaller since the decrease might double from member to member. This would result in three *kav* for Rabbi Yohanan's member. Both answers seem valid according to the solutions attributed to Rav Pappa and "others." After this tricky but still considerably easy start, the puzzle ventures into geometry. The volume of Rav Pappa's member must be calculated based on the radius of the basket. The radius needs to be squared, then multiplied by the height of the basket and the result again multiplied by Pi. Pi appears with the value of 3.0 in rabbinic literature, and the radius of the particular "basket of Hippareneum" is not rendered here but might have been common knowledge.[111]

Life in the countryside was busy, but it was also less disturbed by regular social performances and obligations than life in the city. It thus offered the necessary peace and quiet for intellectual productivity, but also other forms of entertainment. Martial muses somewhat romanticizing:

> Could but you and I, dear Martialis, enjoy carefree days [*tempus otiosum*] and dispose our time in idleness, and both alike have leisure for true living, we should know nothing of the halls and mansions of the mighty, nor sour lawsuits and the gloomy Forum, nor haughty deathmasks: but riding, chatting, books, the Field, the colonnade, the shade, the

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110 Translation follows Boyarin 2009, 182.

111 On the use of Pi in rabbinic literature, see Zuckermann 1878, 23; Feldman 1931, 22–23.

> Virgin [aqueduct], the baths—these should be our daily haunts, these our labors (Martial, *Epigrams* 5.20).[112]

Reference to spare time or leisure in late-antique sources does not, of course, imply the daily intervals of work and leisure to which post-industrial human beings are accustomed. Rather, the Latin *otium* (free time/leisure) and its opposite, *negotium* (busyness), alternated in longer intervals. Rainy seasons and winter, for example, caused *otium*.[113] The life of intellectuals and passionate literati was organized according to these intervals: "Since leisure was a prerequisite for literary interests, whether active or passive, men like Cicero waited for the time and place when the Roman conscience could relax. It could be a national holiday, or springtime in Campania, or high summer in the Alban hills — when the Senate and courts are adjourned, and gentlemen have settled into their villas, bringing their secretaries and readers, and perhaps a visiting philosopher, to keep them company."[114] Similarly, Aulus Gellius wrote in the introduction to his work, "And since, as I have said, I began to amuse myself by assembling these notes *during the long winter nights which I spent on a country-place in the land of Attica*, I have therefore given them the title of Attic Nights."[115] This quote from Gellius completes the above list of possible leisure by adding a season (winter) and a particular time of the day (the night) as *otium*. Gellius is quite consistent with his emphasis on nights and writes elsewhere that, after having bought a number of books, he "ran through all of them hastily in the course of the next two nights (9.4.3)."[116] Late-antique schools in Mesopotamia, both Judean and Christian, similarly profited from times freed of labor and engaged with students seasonally, a month in winter and a month in summer.[117]

Of course, rich people could afford to engage in recreation in a manner that may be described in the modern sense as "leisure," in that it established "a feeling of freedom and pleasure by formulating a sense of choice and desire."[118] Considering the importance of education in the social life of late antiquity, but

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112 Martial, trans. Shackleton Bailey 1993, 346–347.

113 See Macrobius, *Saturnalia* VI.12; or Gellius, *Attic Nights*, Praef. 10. The Aramaic term usually translated with "to idle" (בטל) refers similarly not to voluntary idling, but to the opposite of busyness; see Sokoloff 2002, s.v. בטל(3). "Idlers" (בטלני) stand at the marketplace and wait for somebody to give them a job; see, e.g., b. Pesah. 51b and 55a; b. Ber. 17b; b. Ta'an. 29b; and b. B. Metz. 32b.

114 Fantham 1996, 41.

115 From the preface of Aulus Gellius, trans. Rolfe 1927), xxvii, emphasis mine.

116 Gellius, trans. Rolfe 1927, 163.

117 See Goodblatt 1975, 164.

118 Toner 1995, 17.

also the entertaining quality attributed to it, spending one's free time studying books was to a certain extent also imperative. This imperative to know, together with the limited amount of time available for this purpose, contributed to the time's preference for short and condensed texts such as handy summaries. The latter were much appreciated gifts since they spared laborious research.[119]

Different ethical aspirations were attached to how one spent free time and even eventually became decisive for the term's mainly negative connotation in the middle ages.[120] The cenobite monks, for example, interpreted *acedia* ("sloth") to be equal to the "noontide demon of the Psalms [Ps. 91:5–6], which attacked the cenobites most frequently between the hours of ten and two."[121] At the same time the sun reaches its zenith, the monk's spirit is at its weakest, and he is most likely to do nothing, to become careless, indifferent. *Acedia* was therefore considered a sin among the monks.[122] Similarly, the Talmud assigns times and even periods to demons, during which people should not go out and, in fact, should stay at home.[123] Moreover, the distinction between *otium* and *negotium* is captured with Torah study on the one hand and public obligation and "action" (*derekh erets* and *ma'aseh*) on the other.[124] The numerical maxims under discussion were mostly the product of *otium*/Torah: As the result of time spent with friends and family, associates, or even strangers they were conceived in the dining room of a private house, the synagogue, or even the marketplace.[125]

5 Conclusion

This brief investigation into the factors responsible for the generation and construction of the numerical maxims scattered over the Talmud has essentially shown that learning itself, as well as the occasions for implementing knowledge, was multi-faceted. Although a clear-cut division between *otium* and

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119 E.g., *The Birthday Book*, a summary of the astrology of the time by Censorinus, which he offered to Quintus Carellius on his, well, birthday.
120 Fischler 2001, 178.
121 Kuhn 1976, 43.
122 Kuhn 1976, 43–45.
123 See Harari 2017, 395–396.
124 Klein 2012, 359–362.
125 As Gil Klein noted regarding the relationship between the road and the triclinium: "This pair [road/triclinium] represents the divide separating inside and outside, private and public, academy and city, but also functions as a contact zone where insiders and outsiders, household members and guests, sages and commoners may meet," Klein 2012, 362.

negotium was (and is) not possible, the framing of talmudic texts as the product of leisure gives some liberty to juggle the material and move its formation beyond the study house and into the dining hall of the synagogue or a villa. Conversely, we may also start thinking of the study house as a place that could turn into a location for a banquet.[126]

Knowledge production needs incentives. In the case of the numerical maxims, these were the popularity of small significant units such as maxims and sayings and the social approval gained for outstanding performance, whether smart, witty, sharp, or wise. The maxims could serve all these functions, depending on their content, and they were always attractive due to their organization around numbers. The construction of these maxims needed participants, occasion, location, time, and material. The content of the maxims is so varied that everybody was able to compose them or at least to contributed to its construction by adding one or more elements. Occasions that may have stirred people to compose such maxims may have been public performances, games, the production of witty gift tags or dedications, or even the empty space on public walls.

Locations would have been the above-mentioned dining hall, the synagogue, the study house, or the marketplace, that is, places in which people celebrated or gathered for entertainment. I concluded that entertainment that engaged the attendees, rather than professional entertainers, was more likely to have produced numerical maxims, especially in rural settings. The time when some of these maxims were composed were times reserved for study, when the hustle and bustle of the busy times came to a halt: the night, winter and summer, the Sabbath, the holidays. Others may have emerged just because of the creative hustle and bustle, especially when we think of graffiti. As suitable material support served the already-mentioned wall, small leaf tablets (*pittacia*/פיתקא) or ostraca. Memory may have helped in the composition of these maxims, although retaining more than one maxim per finger or several numerical maxims on the same subject may have been confusing. Moreover, ancient mnemotechnical theory does not build on numbers but on places.[127]

The maxims' mnemotechnical value is only brought forward in the way the Talmud presents them associatively during a symposiac discussion. By so doing, the composers of the Talmud naturalize these crafty little units while actually repurposing them.

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126 This approach ties in with recent suggestions to think of a "study city" instead of a study house (Klein 2012, 341) or a "marketplace of ... education" (Marks 2021, 307).
127 Small 1997, 83.

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