Reconstructing 4Q208–4Q209 as an Astronomical Artefact

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Nowhere in the ancient Mesopotamian and Mediterranean worlds have as many variant and different calendars been found as at Qumran. The diversity within the 364-day Hebrew calendar corpus is a continuing subject of research. Here, the focus is on two proposed Aramaic zodiac calendars: 4Q318 (*4QZodiac Calendar and 4QBrontologion*, registered as *4QZodiology and Brontology*) and 4Q208–4Q209 (*4QAstronomical Enoch* [a-b]). It is argued that these texts are related and that by adopting this model it should be possible to place some of the hitherto unplaced fragments from 4Q208–4Q209.

Expansion of Helen R. Jacobus**, *Zodiac Calendars in the Dead Sea Scrolls and Their Reception: Ancient Astronomy and Astrology in Early Judaism*** (Leiden: Brill, 2014), pp. 305–311

1. Background

The proposed Aramaic calendar concerned that arguably is closely related to 4Q208–4Q209 is 4Q318 which is composed of a zodiac calendar, or “selenodromion” that situates the moon’s position in the zodiac for each day of the year in each month. It has a connected “brontologion,” a zodiacal thunder omen text that yields a Mesopotamian-style prediction that is based on the zodiac sign of the moon on the day of the month when thunder occurs. The title of 4Q318 is registered as *4QZodiology and Brontology* (critical edition: Greenfield and Sokoloff 1995, reproduced with revisions in 2000). The texts are all fragmentary (see also Wise, 1994; Albani, 1993, 1994, 1999; Jacobus 2010, 2011, 2014a).

Following Geza Vermes who gave 4Q318 the title "A Zodiacal Calendar with a Brontologion" (1997, 361), I suggest that *4QZodiac Calendar and 4QBrontologion* is a more useful designation because scholars need to be able to discuss either unit separately in a clear way. This essay concerns *4QZodiac Calendar* without the brontologion in relation to the extremely fragmentary Aramaic texts 4Q208–4Q209 (*4QAstronomical Enoch* [a-b]) (critical editions: Milik, 1976; Tigchelaar and García Martínez, 2000; Drawnel, 2011).

4Q208–4Q209 comprise formulaically written texts that are part of the so-called *Aramaic Astronomical Book of Enoch* from Qumran. The fragments of 4Q209 (*4QAstronomical Enoch*[b]) and 4Q208 (*4QAstronomical Enoch*[a]) as far as is known do not appear in the classical Ethiopic Ge'ez version of *1 Enoch*, although not all of the many Ethiopic manuscripts have been examined (for the Ge'ez manuscript history of *1 Enoch* see Knibb, 1978, 1–46; VanderKam, 2012, 335–352; Erho and Stuckenbruck, 2013).

Neither 4Q318 nor 4Q208–4Q209 were known before the discovery of the Dead Sea Scrolls. I have suggested that in order to reconstruct 4Q208–4Q209 both mathematically and materially (as far as is reasonably possible) the texts should be considered as branches from the same source as *4QZodiac Calendar* (Jacobus 2011, 2014a, and forthcoming).

2. 4Q318. 4QZodiac Calendar

The calendar of 4Q318 states the moon's schematic position in the zodiac on any day of the year according to a calendar of 360 day years, that is, a year composed of 12 months consisting of 30 days each. This is a well-known year-length in Mesopotamian divinatory literature (Brown, 2000, 113-122; Heeßel 2010; Oppenheim, 1974; Williams, 2002) and as an ideal, administrative calendar in the third millennium BCE in Mesopotamia (Brack-Bernsen 2007; Steele, 2011).

I have argued that it is a working luni-solar calendar (Jacobus, 2010; Jacobus, 2011; 2014a); in such a calendar, an extra lunar month is added (intercalated) at fixed intervals because the lunar year of 354 days falls behind the solar year of 365¼ days by 11¼ days. A 30-day lunar month, a 13th lunar month, is added onto the standard lunar year of 354 days — consisting of 12 months — at repeated two and three year frequencies (see Rochberg, 1995). Therefore, to have a calendar with a lunar date that recurs in the same season a leap month must be regularly intercalated in a fixed cycle.

In a schematic 360-day calendar a 30-day lunar month could have been added every six years, as it would fall behind the solar year by 5¼ days each year, according to (Brack-Bernsen, 2007, 89), although scholars are divided as to how the 360-day calendar may have been instituted in practice. Britton states that the 360-day calendar was "devoid of intercalations" (2007, 117).

The moon in *4QZodiac Calendar* changes zodiac signs in a fixed sequence of two days, two days, and then three days in a recurring arrangement. It passes through all 12 signs plus the one that it started out from (so, 13 signs in all) in 30 days in each of its 12 months (schematic synodic months). The month-names are the Aramaic translations of the Babylonian months used in the late biblical books, and have remained so-named in the Jewish calendar.

It is probable that *4QZodiac Calendar* may be a Jewish-Aramaic descendant of similar late Babylonian zodiacal calendar texts with which it bears close structural similarities. These cuneiform texts substitute months and zodiac signs for corresponding consecutive numbers; for example, number 1 represents the Month I, and the first zodiac sign, Aries (Brack-Bernsen and Steele, 2004; Steele 2015; 188, 209, 210). Since the month-names in *4QZodiac Calendar* are Aramaic versions of the Babylonian months-names it is highly likely that the calendar is closely related to its Mesopotamian cousins.

3. 4Q208-4Q209 as a second Aramaic zodiac calendar in the Dead Sea Scrolls

a. In relation to 1 Enoch

I have also argued that 4Q208–4Q209 (*4QAstronomical Enoch*[a-b]) follows a similar pattern to 4Q318: that it is basically a luni-solar calendar with the major modification that the cosmological ‘gates’ numbered 1 to 6 in the text should be identified as the zodiac signs. This is similar to the system of number-month-sign substitution in late Babylonian astrological texts (see Brack-Bernsen and Steele, 2004; Jacobus, 2011, 2014a, 2014b; Steele, 2015, op cit).

This hypothesis is based on directly relating the ordinal numbers of the heavenly gates in *1 Enoch*, Chapter 72, the first chapter of the Ethiopic *Book of Luminaries* (*1 En*. 72–82), not only as months but to corresponding zodiac signs (a thesis that was originally suggested by Laurence, 1821). *1 En.* 72 is concerned with the daylight lengths of two “solar” months opposite each other in a 364-day calendar beginning with the spring equinox. One ‘gate’ represents two months and, it is argued, the two zodiac signs with which they are cognate. See Table 1 for the description of the sun’s journey throughout the year in *1 En*. 72 with the numbered gates, the months to which they correspond, and the zodiac signs that correspond with the months.

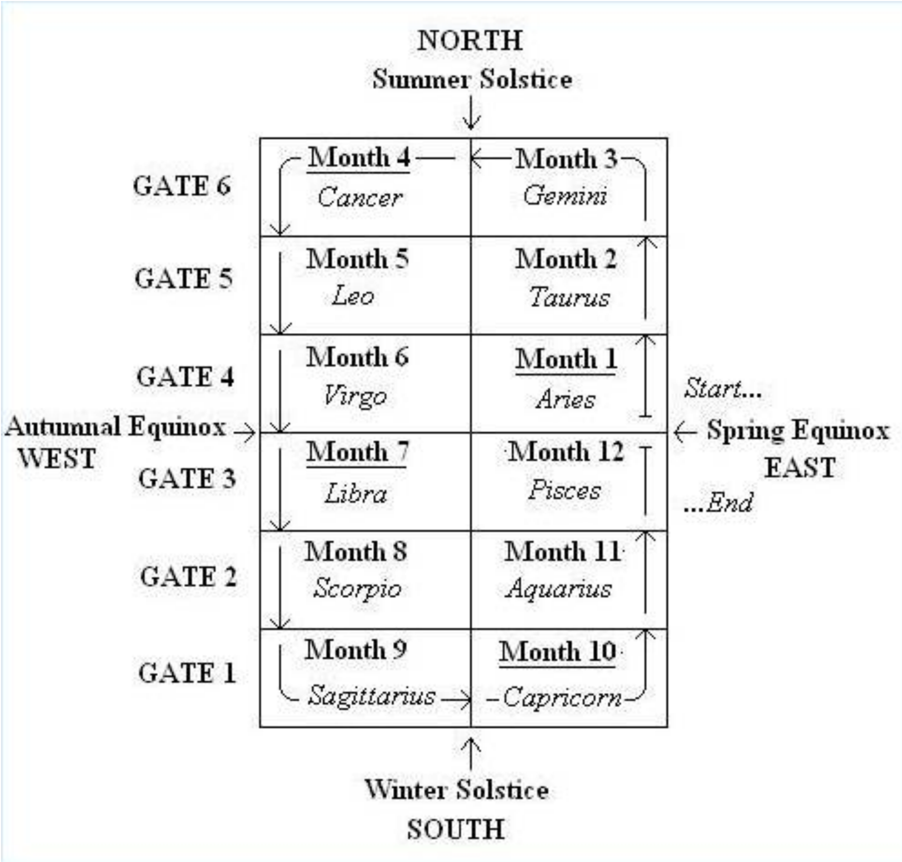

Table 1. A basic representation journey of the sun in *1 En*. 72 beginning with sunrise at the Spring Equinox in Gate 4, Month 1, Aries (the 1st sign of the zodiac); Gate 4 also represents the Month 6, Virgo (the 6th sign of the zodiac)

Neugebauer defined the heavenly gates in *1 En*. 72 as the sun's rising and setting points on the horizon during the year: the sun rises in Gate 4 at the spring and autumn equinoxes (Month 1 and Month 6), and so on (Neugebauer 1964, 1981). He rejected the interpretations of the earlier translators and commentators of *1 Enoch* that the 'gate' numbers represented signs of the zodiac corresponding to the months (Neugebauer, 1979, 156–161. For the scholarly history of the zodiac hypothesis in the Book of Luminaries in *1 En*, see VanderKam, 2012, 371–373; Jacobus, 2014a, 263–268). Recent research in the development of Mesopotamian zodiacal astronomy has led to a resurgence of interest in the subject (Ratzon, 2015).

3b. 4Q208-4Q209 as a calendar

Milik described the astronomical scheme in these Aramaic fragments as a "synchronistic calendar," maintaining that the material related to the sun and the moon in the text were related to a single year of the luni-solar calendar of a three-year cycle, a triennial cycle (Milik 1976, 274–275).[1]

He contended that the synchronistic calendar of 4Q208–4Q209 was the equivalent mathematically to 364 days of three ('solar') years equalling three lunar years of 354 days, each consisting of alternate 29 and 30 day months, with the addition of an intercalary lunar month of 30 days (364 days x 3 = 354 days x 3+30 days).

Milik reasoned that the manuscript of 4Q209 consisted of one 354-day lunar year of this cycle that was 10 days shorter than the schematic 'solar' year. (The term 'solar year' for the 364-day year is misleading since the solar year is about 365.24 days but it is used to distinguish it from the lunar year).

Some later scholars have argued that the synchronised schematic 'solar' year would be 360 days, as it is in the zodiac calendar of 4Q318 and in the Mesopotamian background of the *Book of Luminaries* (Albani 1993, 27–35; 1994, 82–83; see also Jacobus 2014a, 334–340). Others, that although the synchronised year of 360 days had been expanded to 364 days at an unspecified very early stage in its redaction (Ben Dov, 2008, 37, 282), 4Q209 cannot support a triennial cycle mathematically (Ben Dov 2008, 129–132). Unlike the calendar in the *Book of Jubilees*, the calendar of 4Q208–4Q209 does not mention Sabbaths, days of the week, or festivals as do some of the 364-day Hebrew calendars of the priestly courses at Qumran.

Drawnel rejects Milik's model of the luni-solar synchronistic calendar, proposing instead that 4Q208–4Q209 is a lunar table denoting the varying time periods of lunar visibility during the day and night (Drawnel, 2011, 237-259). He argues that the sun's presence in the text constitutes scribal insertions that refer to the sun's movements during

[1] Milik's theory is followed by Eshbal Ratzon (2107), who argues that fragments of 4Q209 come from the triennial cycle rather than from a single year of it, as Milik had contended. My counter argument to Ratzon is forthcoming.

the night, rather than to a calendrical component (Drawnel 2011**,** 297–300). Milik's data have been accepted by Tigchelaar and García Martínez (2000); Duke and Goff have suggested modifications to the synchronistic calendar scheme to incorporate Drawnel's thesis (2014).

4Q208–4Q209 contain the day of the lunar month and proportions of the moon's "shining" and "darkness" and "concealment" and other terms to describe the moon's daily phases in incremental fractions of half-sevenths in the text. There are also different verbs that describe its waxing and waning day-by-day (Drawnel 2011, 237–301). Drawnel's reconstruction of the fractions of the moon's light in all the fragments, as far as possible, and his contextualising this information within a 29-day or 30-day month scheme, often from extremely scanty text, is a valuable assistance to scholars.

The left-hand column of the largest fragment (4Q209, frg 7 column iii in the critical editions, renumbered as Fragment 1 in the *Leon Levy Dead Sea Scrolls Digital Library* website) is a key textual unit. It arguably supports the interpretation that the numbered 'gates' in the formulaic structure of the Aramaic text through which the sun and moon rise and set correspond to the zodiac signs.

The data in 4Q209 fragment 7, column iii begin with the sun's movements in Gate 1, coinciding with Nights 8-9 of a lunar month. Milik calculated from the fractions in the text that the month was Month X and he referred to the date as the 8th day of the 10th lunar month, as "the 8th Tebeth" using the Aramaic month name for the 10th month in the luni-solar- triennial cycle, which he argued existed in the text, is not relevant to the Babylonian calendar which uses a 19-year luni-solar cycle (Neugebauer, 1975; Rochberg, 1992)].

The waxing moon rises in Gate 5 for the first time during day 9 of the lunar month (4Q209, frg 7 col. iii, lines 7-8) and sets in Gate 5 on Night 10 (after sunset, lines 8-9), see Figure 1.[2]

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[2] The text for Night 9 is interrupted by the passage of the sun. The moon appears to set twice: once immediately before the entry of the sun without a given gate number (line 5) and then immediately after the entry of the sun, when it states that the moon sets in Gate 5 (line 6). This seems to be a duplication of the position in the textual formula for the moonset. Compare the formula in 4Q209 3: the moon shines, sets and rises in Gate 3 on Night and Day 4 (lines 6-8) and will set in Gate 3 for the first time after it has risen in Gate 3, on Night 5 (line 8, recon, Drawnel, 2011, 150-151). My reconstruction in Figure 1 and Tables 2 and 3, is based on a sunset-to-sunset calendar and assigns the moon's gate number to the gate in which it first rose. In 4Q208 frg 24 col i. the gate number in which the moon rises is noted, but not the gate number in which it sets (text and translation: Drawnel 2011, 118-120).

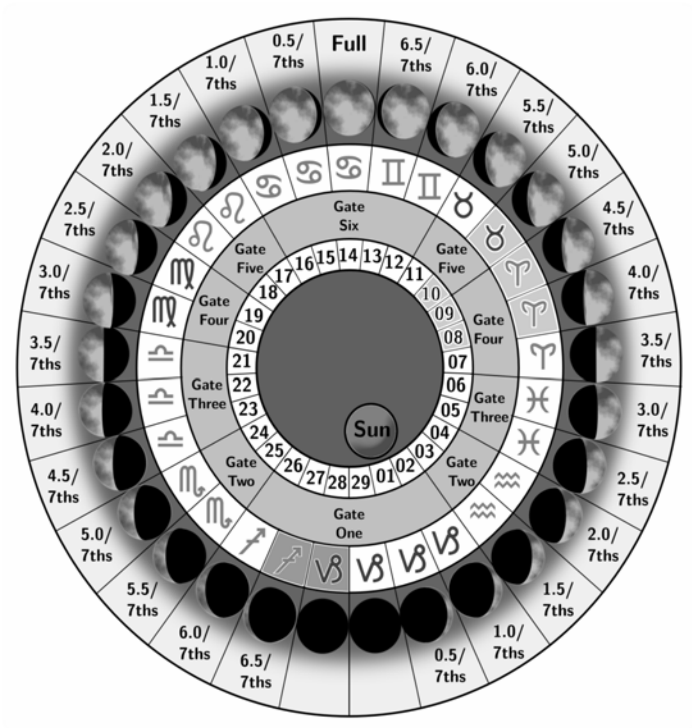

Figure 1: Basic diagram to illustrate moon's data (reconstructed) in 4Q209 frg 7 column iii: showing days of the month, 'gates,' corresponding zodiac signs, lunar phases and lunar fractions in half-sevenths

Converting the gate numbers into their cognate zodiac signs, and taking into account the lunar fractions in half-sevenths in the text (from which one can identify the phase of the moon, either in terms of time relations [Drawnel], or visually, by linear progressions of light and darkness on the moon's surface [Milik, 1976; Tigchelaar and García Martínez, 2000]) would mean, according to the hypothesis, that the sun, which takes a month to travel through one zodiac sign, moves from Sagittarius (Gate 1) into Capricorn (Gate 1) the winter solstice.

The moon sets in Gate 5 (Taurus) after sunset on Night 9 (however, the moonset is duplicated in the text, and the formula is problematic at this point, as noted above), rising in Gate 5 on the same day for the first time. As the moon sets on Night 10, in a sunset-to-sunset calendar Gate 5 is assigned to Night 10, not Night 9 in Month X, (see Table 1 for corresponding months and zodiac signs).

Using Milik's illustrative assignation, the first night in question, "8th Tevet" (4Q209, fragment 7 column iii, line 1) coincides with the winter solstice in some years in the Babylonian horoscopes in the Mesopotamian calendar (Rochberg 1998, 44, 78; Jacobus 2011, 100, 194–200; 2014a 291–311). Accordingly, the calendar of 4Q208–4Q208 may well follow a 19-year luni-solar cycle known from late Babylonian texts (Rochberg, 1998; Steele 2007) and from the Greek Metonic cycle dated to 432 BCE (Pritchett and Neugebauer,1947, 1–14; Neugebauer, 1975, 622-624; Hannah, 2005, 55–58).

4. Findings

It is possible to substitute the existing numerical data of the 'gates' in the fragments in the synchronistic calendar of 4Q208–4Q209 with their corresponding zodiac signs. If we also followed a schematic two and three-day arrangement of the moon's stay in each zodiac sign based on a similar arrangement in *4QZodiac Calendar* and the increments of half-sevenths of the moon's waxing and waning for 29 and 30-day months reconstructed by Drawnel, we could theoretically reproduce the lunar year in 4Q208–4Q209 from the larger extant and reconstructed fragments, see Table 2. In Table 3, the zodiac signs and the gate numbers are placed together using the existing and restored text in order to illustrate the reconstruction fully. As can be seen from the tables, the suggested model begins on Day 1, Month I: moonrise in Aries, Gate 4, a 30-day month, in a calendar in which the days begin at sunset. The signs of the zodiac follow in their consecutive order according to the schematic arrangement described. No two nights in the year can have the same data.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	29	30
1	♈	♉	♊	♋	♌	♍	♎	♏	♐	♑	♒	♓	.5	
2	♈	♉	♊	♋	♌	♍	♎	♏	♐	♑	♒	♓	1	.5
3	♉	♊	♋	♌	♍	♎	♏	♐	♑	♒	♓	♈	1.5	1
4	♉	♊	♋	♌	♍	♎	♏	♐	♑	♒	♓	♈	2	1.5
5	♊	♋	♌	♍	♎	♏	♐	♑	♒	♓	♈	♉	2.5	2
6	♊	♋	♌	♍	♎	♏	♐	♑	♒	♓	♈	♉	3	2.5
7	♋	♌	♍	♎	♏	♐	♑	♒	♓	♈	♉	♊	3.5	3
8	♋	♌	♍	♎	♏	♐	♑	♒	♓	♈	♉	♊	4	3.5
9	♋	♌	♍	♎	♏	♐	♑	♒	♓	♈	♉	♊	4.5	4
10	♌	♍	♎	♏	♐	♑	♒	♓	♈	♉	♊	♋	5	4.5
11	♌	♍	♎	♏	♐	♑	♒	♓	♈	♉	♊	♋	5.5	5
12	♍	♎	♏	♐	♑	♒	♓	♈	♉	♊	♋	♌	6	5.5
13	♍	♎	♏	♐	♑	♒	♓	♈	♉	♊	♋	♌	6.5	6
14	♎	♏	♐	♑	♒	♓	♈	♉	♊	♋	♌	♍	**(7)**	6.5
15	♎	♏	♐	♑	♒	♓	♈	♉	♊	♋	♌	♍	6.5	**(7)**
16	♎	♏	♐	♑	♒	♓	♈	♉	♊	♋	♌	♍	6	6.5
17	♏	♐	♑	♒	♓	♈	♉	♊	♋	♌	♍	♎	5.5	6
18	♏	♐	♑	♒	♓	♈	♉	♊	♋	♌	♍	♎	5	5.5
19	♐	♑	♒	♓	♈	♉	♊	♋	♌	♍	♎	♏	4.5	5
20	♐	♑	♒	♓	♈	♉	♊	♋	♌	♍	♎	♏	4	4.5
21	♑	♒	♓	♈	♉	♊	♋	♌	♍	♎	♏	♐	3.5	4
22	♑	♒	♓	♈	♉	♊	♋	♌	♍	♎	♏	♐	3	3.5
23	♑	♒	♓	♈	♉	♊	♋	♌	♍	♎	♏	♐	2.5	3
24	♒	♓	♈	♉	♊	♋	♌	♍	♎	♏	♐	♑	2	2.5
25	♒	♓	♈	♉	♊	♋	♌	♍	♎	♏	♐	♑	1.5	2
26	♓	♈	♉	♊	♋	♌	♍	♎	♏	♐	♑	♒	1	1.5
27	♓	♈	♉	♊	♋	♌	♍	♎	♏	♐	♑	♒	.5	1
28	♈	♉	♊	♋	♌	♍	♎	♏	♐	♑	♒	♓		.5
29	♈	♉	♊	♋	♌	♍	♎	♏	♐	♑	♒	♓		
30	♈		♊		♌		♎		♐		♒			

Table 2: Reconstruction of 4Q209 lunar year substituting gate numbers for zodiac signs

Top row: months; left column: days of month. The moon's fractions in half-sevenths of waxing and waning for 29 and 30-day months are in the two far-right hand columns. The shaded areas are the existing or reconstructed fragments with 'gate' numbers

Key: Aries ♈: Gate 4; Taurus ♉: Gate 5; Gemini ♊: Gate 6; Cancer ♋: Gate 6; Leo ♌: Gate 5; Virgo ♍: Gate 4; Libra ♎: Gate 3; Scorpio ♏: Gate 2; Sagittarius ♐: Gate 1; Capricorn ♑: Gate 1; Aquarius ♒: Gate 2; Pisces ♓: Gate 3

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	29	30
1	4♈	5♉	6♊	6♋	5♌	4♍	3♎	2♏	1♐	1♑	2♒	3♓	.5	
2	4♈	5♉	6♊	6♋	5♌	4♍	3♎	2♏	1♐	1♑	2♒	3♓	1	.5
3	5♉	6♊	6♋	5♌	4♍	3♎	2♏	1♐	1♑	2♒	3♓	4♈	1.5	1
4	5♉	♊	6♋	5♌	4♍	3♎	2♏	1♐	1♑	2♒	33♓	**4**♈	2	1.5
5	6♊	4♋	5♌	4♍	3♎	2♏	1♐	1♑	2♒	**3**♓	4♈	5♉	2.5	2
6	6♊	6♋	5♌	4♍	3♎	2♏	1♐	1♑	2♒	3♓	4♈	5♉	3	2.5
7	6♋	5♌	4♍	3♎	2♏	1♐	1♑	2♒	3♓	4♈	5♉	6♊	3.5	3
8	6♋	5♌	4♍	3♎	2♏	1♐	1♑	2♒	3♓	4♈	5♉	6♊	4	3.5
9	6♋	5♌	4♍	3♎	2♏	1♐	1♑	2♒	3♓	4♈	5♉	6♊	4.5	4
10	6♌	4♍	3♎	2♏	1♐	1♑	2♒	3♓	4♈	**5**♉	6♊	6♋	5	4.5
11	6♌	4♍	3♎	2♏	1♐	1♑	2♒	3♓	4♈	5♉	6♊	6♋	5.5	5
12	4♍	3♎	2♏	1♐	1♑	2♒	3♓	4♈	5♉	6♊	6♋	5♌	6	5.5
13	4♍	3♎	2♏	1♐	1♑	2♒	3♓	4♈	5♉	6♊	6♋	5♌	6.5	6
14	3♎	2♏	1♐	1♑	2♒	3♓	4♈	5♉	6♊	6♋	5♌	4♍	(7)	6.5
15	3♎	2♏	1♐	1♑	2♒	3♓	4♈	5♉	6♊	6♋	5♌	4♍	6.5	(7)
16	3♎	2♏	1♐	1♑	2♒	3♓	4♈	5♉	6♊	6♋	5♌	4♍	6	6.5
17	2♏	1♐	1♑	2♒	3♓	4♈	5♉	6♊	6♋	5♌	4♍	3♎	5.5	6
18	2♏	1♐	1♑	2♒	3♓	4♈	5♉	6♊	6♋	5♌	4♍	3♎	5	5.5
19	1♐	1♑	2♒	3♓	4♈	5♉	6♊	6♋	5♌	4♍	3♎	2♏	4.5	5
20	1♐	1♑	2♒	3♓	4♈	5♉	6♊	6♋	5♌	4♍	3♎	2♏	4	4.5
21	1♑	2♒	3♓	4♈	5♉	6♊	6♋	5♌	4♍	3♎	2♏	1♐	3.5	4
22	1♑	2♒	3♓	4♈	5♉	6♊	6♋	5♌	4♍	3♎	2♏	1♐	3	3.5
23	1♑	2♒	3♓	4♈	5♉	6♊	6♋	5♌	4♍	3♎	2♏	1♐	2.5	3
24	2♒	3♓	4♈	5♉	6♊	6♋	5♌	4♍	3♎	2♏	1♐	1♑	2	2.5
25	2♒	3♓	4♈	5♉	6♊	6♋	5♌	4♍	3♎	2♏	1♐	1♑	1.5	2
26	**3**♓	4♈	5♉	6♊	6♋	5♌	4♍	3♎	**2**♏	1♐	1♑	2♒	1	1.5
27	3♓	4♈	5♉	6♊	6♋	5♌	4♍	3♎	2♏	1♐	1♑	2♒	.5	1
28	4♈	5♉	6♊	6♋	5♌	4♍	3♎	2♏	1♐	1♑	2♒	3♓		.5
29	4♈	5♉	6♊	6♋	5♌	4♍	3♎	2♏	1♐	1♑	2♒	3♓		
30	4♈		6♊		5♌		3♎		1♐		2♒			

Table 3. Reconstruction of 4Q208-4Q209 lunar year, with zodiac signs corresponding to the 'gate' numbers (extant gate numbers in bold).

The shaded areas described below represent fragments with existing or reconstructed gate numbers based on textual data. These may be identified as describing dates in Month 1, Month 9, Month 10, and Month 12. The selected, abbreviated data for the shaded areas are as follows (see Drawnel 2011 for the fragment numbering transcription, translation, and restoration).

Month 1, 4Q209 fragment 16. Night 25: the moon is hidden for 5/7ths; it shines for 2/7ths. Night 26: the moon is hidden for 5.5/7ths (based on the fractions, it is a 30-day month). The moon is in Gate 3 (Pisces) (line 2).

Month 9, 4Q209 fragment 7, column ii: Nights 23 [the moon sets and enters Gate 3 (Libra)] to Night 27, Gate 2 (Scorpio). The moon sets in Gate 2 on Night 25, and rises on Night 26 [in the morning, since it is a waning moon] (lines 8, 10) (a 30-day month).

Month 10, 4Q209 fragment 3: Night 4, the moon is 5/7ths dark, and on Night 5 [the moon leaves Aquarius] the moon sets and enters Gate 3 (Pisces) (line 7); it is light for 2.5/7ths and it rises on the same day [in daylight] (line 8, restored) (a 29-day month).

Month 10, 4Q209 fragment 7, column iii: Nights 8 to Day 10. The sun rises in Gate 1 (Sagittarius to Capricorn); the moon sets in an unnumbered gate on Night 9 (lines 4-5) and appears to set again in Gate 5 on Night 9 (line 6), rising in Gate 5 on the same day (lines 6-8), and sets on Day 10 (lines 8-9) (a 29-day month).

Month 12, 4Q208 fragment 24, column i: Night 2 to Day 6**;** Night 3: the moon is 1.5/7ths light and dark for 5.5/7ths. The moon rises from Gate 4 (line 3) for the first time during Day 2 (lines 1-4), and sets during Night 3 [in Gate 4] (Aries) (lines 4-5, reconstructed) (a 29-day month).

Using this theoretical system, it may be possible eventually to reconstruct the calendrical cycles of the Aramaic zodiacal calendars from Qumran with more precision. The implication of this research is that it is likely that in Second Temple Judaism groups used the Aramaic and Hebrew calendars for separate purposes. There is no evidence to suggest that the Aramaic calendars were of less importance than the Hebrew 364-day calendars in the Qumran corpus. They may have been taught within the pedagogic framework of angelic mythology known from 1 Enoch, and as such represented another form of calendrical knowledge that had been modified from its Mesopotamian roots for use within the complex culture of early Judaism.

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