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Fragment of the month
FOTM 2022
- Fragment of the Month: November 2022
- Fragment of the Month: October 2022
- Fragment of the Month: September 2022
- Fragment of the Month: August 2022
- Fragment of the Month: July 2022
- Fragment of the Month: June 2022
- Fragment of the Month: May 2022
- Fragment of the Month: April 2022
- Fragment of the Month: March 2022
- Fragment of the Month: February 2022
- Fragment of the Month: January 2022

FOTM 2023
FOTM 2021
FOTM 2020
FOTM 2019
FOTM 2018
FOTM 2017
Fragment of the Month: December 2016
Fragment of the Month: November 2016
Fragment of the Month: October 2016
Fragment of the Month: September 2016
Fragment of the Month: August 2016
Fragment of the Month: June 2016
Fragment of the Month: May 2016
Fragment of the Month: April 2016
Fragment of the Month: January 2016
Fragment of the Month: September 2015
Fragment of the Month: August 2015
Fragment of the Month: June 2015
Fragment of the Month: April 2015
Fragment of the Month: March 2015
Fragment of the Month: February 2015
Fragment of the Month: January 2015
Fragment of the Month: December 2014
Fragment of the Month: November 2014
Fragment of the Month: October 2014
Fragment of the Month: September 2014
Fragment of the Month: May 2014
Addendum to November 2011's Fragment of the Month
FRAGMENT OF THE MONTH ARCHIVE

Fragment of the Month: April 2022

An eighth-century Easter cycle in Hebrew (T-S NS 98.51)

Sacha Stern

Folder T-S NS 98 has long been known to me for its numerous calendar fragments, but it was not until Gideon Bohak asked me four years ago to clarify the meaning of T-S NS 98.51 that I realized its uniqueness and significance. This fragment presents a description of the Christian calendar and how to calculate its dates, in its Byzantine version: this includes the months of the Julian calendar, the Byzantine count of years, and the computation of the date of Easter. It can be dated palaeographically to around 1000, although the text on Easter was redacted much earlier, in the early eighth century.[1]

Descriptions, or even mere mentions, of the Christian calendar are rare in the Cairo Genizah.[2] But what is most remarkable about this text is its extreme earliness. This is by far the earliest known Jewish description of the Christian calendar. This opens up a new perspective on Jewish interest in Christianity in the early Islamic period.

The fragment, a parchment bi-folio, is frustratingly very mutilated, but enough has been preserved to enable a partial reconstruction of the text – thanks to the formulaic nature of calendar texts – and to get a good sense of the missing contents. Maximum dimensions of each folio are 15 x 9 cm, with margins of 1 cm (top), 2 cm (bottom), 1 cm (inner – outer is unknown). I estimate the width of the text is about 7 cm, based on lines that can be reconstructed with near certainty (e.g. recto left ll. 15-16). Stitch-holes appear at 1.5-2.0 cm intervals. It is unclear whether the folios are continuous.

T-S NS 98.51 recto and T-S NS 98.51 verso

Synopsis (with conjectures in square brackets)

Recto left

1-13: lengths of the months and years, solar and lunar. [The Julian leap year.]

13-19: calculation of the day of the week when any Julian month starts (October, November, etc.): (1) month by month;

Verso right

1-7: (continued) (2) year by year, in the 28-year cycle.

7-11: when the 28-year cycle starts.

11-20: the new moon (molad) according to 'their' calculation.

Verso left

1-6: ?

7-21: Easter calendar: the dates of Passover according to the Byzantine 19-year cycle, years 1-14.

Recto right

1-5: (continued) years 15-19.

5-18: Masoret Ezra (prognostication text, based on 1 January).

Preliminary, simplified edition (excluding Masoret Ezra)

Recto left

1	… will know the solar months	[......]ה יהא יודע חדשי ש[מש]	1
2	… each month has 30 days and 10 hours	א [.....]חד חדש יש בו ל יום וי שעות]	2
3	and a half, which comes to three hundred and sixty-	וחצי ו[הן] עולים שלש מאות וש[שים]	3
4	five days and six hours in the year.	וחמש[ה ימים ושש] שעות [לשנה]	4
5	Each year there remains 6 hours, [and in four years	נותר [לכל שנה ו] שעות ו[לארבע שנים?]	5
6	this comes to one day, and they make of it	זה [עולה אחד י]ום וע[ושים ממנו?]	6
7	a leap year] ….	[שנת עיבור ....]יק[.........]	7
8	The lunar months are of 29 days and a half	[חדשי לבנה] הן מן כ֯ט֯[ימים וחצי]	8
9	and two thirds of an hour and 73 parts, which make three	ושת[י ידות] שעה וע֯ג֯ [חל]ק [והן שלוש]	9
10	hundred and fifty-four days, eight	מאות וחמשים וארבע ימ[ים ושמונה]	10
11	hours and 876 parts. Solar years	שעות וחלק(ים) ת֯ת֯ע֯ו֯ [שנים שלחמה]	11
12	exceed lunar ones by 10 days, 21	יתירות משללבנה י [ימים וכ֯א֯]	12
13	hours and 204 parts. To find on which	שעות ור֯ד֯ חל(קים) > הרוצ[ה למצוא באיזה]	13
14	(week)day their Kalends fall, let him take from Marheshvan[4]	יום יבוא קלנדס שלהן יט[ול ממרחשון]	14
15	3 days, from Kislev 2 days, from Tevet 3 days,	[ג֯] ימים מכסליו ג֯[3] ימים מטבת [ג ימים]	15
16	from Shevat 3 days, from Adar in a leap year	[מ]שבט ג ימים ומאדר כש[יש עיבור]	16
17	1 day, from Nisan 3 days, and from all (other) months	א֯ יום ומניסן [ג י]מים ומכ[ל חודש]	17
18	take the days in excess	יטול ממנו [הימים היתירים]	18
19	of 28 days, until the desired month.	מ[כ֯ח֯?] ימים עד החוד[ש שירצה?]	19

Verso Right

1	For every desired month, let him calculate	[ולכל] חודש שרוצה למצוא י[חשוב?]	1
2	how many years have gone into the 28-year cycle	[... כ]מה שנים ניכנסו למחזור [כ֯ח֯ שנים]	2
3	and from each one take 1 day and another day from every four	[....] וכ>י<טול מכל >אחת< יום א֯ ועוד י[ום מ]ן ארבעה	3
4	years, add them all up, cast out the 7s, and see	[שנים ויכ]ללם כו[לם ויוציאם] ז֯ז֯ ויראה	4
5	how many are left. If 3 [are left, it will come	[כמה נות]רו אם [נותרו] ג יבוא	5
6	on Wednesday, if 2, on Tuesday, if 1, on Monday,	[ביום ד֯ אם] ב֯ ביום [ג אם א֯] ביום	6
7	and so the whole week.] To find	ב֯ ולכל השבו]ע< [הרוצה]	7
8	when the first year falls,	[למצוא מתי נו]פלת שנ[ה ראשונ]ה?	8
9	[let him calculate from the year 4105 (344/5 CE)	[יחשוב משנת] ארבעת א[לפים וקה]?	9
10	which is year 1] of the count of the years of the cycles	[שהיא שנה א֯ ?] מחשבון שנת[מחז]ורי	10
11	of 28 and 19 years.[5] To find	[כ֯ח֯ ו]י֯ט֯ שנה < הרוצה [למ]צוא	11
12	the molad[6] according to their calculation, let him calculate the days of every	[המולד בח]שבון שלהן יחשוב ימי [כל]	12
13	month, (starting) from January 31, February	[חודש מ]ן יונאריס ל֯א֯ פבראריס	13
14	28 or in a leap year 29, until the month	[כ֯ח֯ וב]עיבור כ֯ט֯ עד שתבוא בחודש	14
15	in which the *molad* of the moon[7] occurs, and see how much	[בו יה]א מולד לבנה וראה במה	15
16	the solar month exceeds from	[חו]דש שלחמה י[ותר מ]אשר	16
17	… in the days of the month …	[...] בימי החודש [..]ף שבו	17
18	… 19 years and take	[................ י]ט֯ שנה ויטו[ל]	18
19	…. the first	[..................]ה ראשונים	19
20	… that remains from completing	[...........מ]ה שנשתייר מלהשלים	20

Verso left

1	…	[..........] הבח?	1
2	… nine hours …	[...] ת[שע שעות .]ק[...] תש	2
3	…	[..]ויא ת֯ צ֯י [........]	3
4	day 6 …	יום ו [.........]צא:	4
5	new … parts	ר[.]ש [.........] ח֯ל֯[ק]	5
6	new …	ראשי [.........] ם [....]	6
7	<u>The 19-year [cycle]</u>	[מחזור] י֯ט֯	7
8	[First] year: Passover falls on 2 (April),	שנ[ה ראשונה יבוא פ]ס֯ח בש[נים]	8
9	[…]day. [Year 2: Pass. falls on] 2[2 (March),]	יום [.. שנה ב֯ יב֯ פ֯ס֯] בעשרים ו[שנים]	9
10	[…]day. [Y3: intercalation,] Pass. falls on 10 (April), […].	יום [.. ש֯ ג֯ עיבור יבו]א פ֯ בעשרה [יום ..]	10
11	Y4: Pass. falls on 30 (March), Tuesday	ש֯ ד֯ יב֯ [פ֯ בשל]ושים יום ג֯	11
12	Y5: Pass. falls on 19 (March), […]day	ש֯ ה֯ יב֯ פ֯ס֯ בתשע עשרה יום [..]	12
13	Y6: intercalation, Pass. falls on 7 (April), Friday	ש֯ ו֯ עיבור יב֯ פ֯ס֯ בשבעה יום ו֯	13
14	Y7: Pass. falls on 27 (March), […]day	ש֯ ז֯ יב֯ פ֯ס֯ בעשרים ושבעה י [..]	14
15	Y8: intercalation, Pass. [falls] on 15 (April), […]	ש֯ ח֯ עיבור [יב֯] פ֯ס֯ בחמשה עש[ר י ..]	15
16	[Y9]: Pass. falls on 4 (April), Saturday	[ש֯ ט֯] יב֯ פ֯ס֯ [ב]ארבע י ז֯	16
17	[Y10: Pass. falls on …,[Tuesday	[ש֯ י֯ יב֯ פ֯ס֯ ב..] י ג֯	17
18	[Y11[: intercalation, [Pass. falls on …], Tuesday	[ש֯ י֯א֯] ע[י]בו[ר יב֯ פ֯ס֯ ב..] י ג֯	18
19	[Y12[: Pass. falls [on …], Sunday	[ש֯ י֯ב֯] יב֯ פ֯ס֯ [ב... י] א֯	19
20	Y13: Pass. falls on […, …]	[ש֯ י֯ג֯] יב֯ פ֯ס֯ ב[... ...]	20
21	Y14: intercalation, Pass. falls on 9 (April), Tuesday	[ש֯ י֯ד֯] עיבור יב֯ פ֯ס֯ [בתש]ע[8] י ג֯	21

Recto right

1	[Y15: Pass. falls on …, ..]day	[ש֯ י֯ה֯ יב֯ פ֯ס֯ ב... י [...]	1
2	[Y16]: Pass. [falls on …, …]	[ש֯ י֯ו֯ יב֯] פ֯ס֯ [ב... י ..]	2
3	[Y17]: intercalation, [Pass. falls on …, …]	[ש֯ י֯ז֯ עיב]ור יב֯ [פ֯ס֯ ב.. י ..]	3
4	[Y18: Pass. falls on …, …]	[ש֯ י֯ח֯ יב֯ פס ב.. י ..]	4
5	[Y19: intercalation,] Pass. [falls on …, … If][9] the	[ש֯ י֯ט֯ עיבור יב֯] פ֯ [ב.. י .. < אין] אתא	5

Although there is much to say about this fascinating text, of greatest immediate interest is the final section, which lists the dates and days of the week of Passover (*Pesah*) over a 19-year period, that is apparently identified as a 'cycle'. As the list progresses, the use of abbreviations increases (e.g. יב֯ פ֯ס֯ for יבוא פסח, and from Year 5, a broken *shin* for שנה), and the layout becomes increasingly tabular, with a separate line for each year of the cycle, and the weekday in a column to the left.

At first sight, a Hebrew text about 'Passover' would be referring to the Jewish festival, and the 19-year cycle would be that of the Jewish calendar. On closer analysis, however, these dates must be Christian and derived from the Easter computation. The date of Easter is lunar, as it originated in fact from the Jewish Passover. In the fourth century CE, a system for calculating the date of Easter was instituted in Alexandria, from where it spread to the Roman East and, eventually, the entire Christian world. This calculation is based on a 19-year cycle that provides, for each of the 19 years, the deemed date of Passover; Easter is held on the following Sunday. The date of Easter Sunday is thus variable and depends on the date of Passover and on the day of the week, in any given year, when Passover falls. The dates of Passover, in March and April, are constant, but the Passover weekdays change from cycle to cycle. After 28 repetitions of the 19-year cycle, the sequence of Passover weekdays repeats itself: this is the grand cycle of 532 years.

Several indications support the identification of this cycle as Christian. It comes in our text after a description of the Julian calendar, with an allusion to the cycle of 532 years, and an explanation of 'their' calculation of the *molad* (although the continuity of verso left with verso right is unclear). Moreover, the dates of Passover are given according to the Julian calendar (with fixed dates in March and April) – a well-known Christian practice.[10]

More importantly, the dates in our text only match the Christian Easter cycle, specifically the Byzantine cycle (in the Alexandrian tradition, the cycle is the same but begins three years earlier). Although the text is very fragmentary, enough survives to show that the sequence of dates and weekdays does not match any 19-year cycle of the Jewish calendar at any point in the centuries leading up to and following 1000 CE. It does match very closely, however, the Christian 19-year cycle. In this cycle, as mentioned above, the sequence of weekdays is unique and occurs only once in 532 years. The sequence of weekdays in our text offers the best match, by far, with the Easter 19-year cycle beginning in 725 CE. This must be what our fragment describes, and this is most likely, therefore, when the text was originally composed. Anyone writing at any other time would have chosen the current 19-year cycle instead.

The dating of this text to c. 725 CE might appear extremely early, but it makes historical sense. The Byzantine cycle was created at some point in the seventh century; it was in use in Palestine by the eighth century, as suggested by some Palestinian Christian inscriptions.[11] Its relative novelty may have sparked the interest of our author, who translated it here into Hebrew. This also identifies our text as Palestinian (in Egypt, the Coptic Alexandrian cycle would have been used, as found in some later Genizah texts).

The match of our text with the Christian Easter cycle is not complete, as it deviates from it in two ways: (1) Intercalation (insertion of a second month of Adar) occurs in years 6 and 17, as in the Jewish cycle, instead of years 5 and 16, as in the Christian cycle; (2) Wednesdays have been changed to Tuesdays – perhaps, because in the rabbinic calendar Passover cannot fall on Wednesday. Both look like a Judaization, or rabbinization, of the Christian cycle.

Why was this Christian cycle Judaized? The blame could be laid on well-meaning scribes, who might not have understood that they were copying a Christian calendar. But the nature of the corrections suggests to me that they were deliberate and authorial. *Fragment of the Month* is not the place to debate the matter in detail, but I would argue that our author translated the Easter cycle with an intention to put it to Jewish use: in other words, to calculate the dates of the Jewish Passover. That is why some of the dates needed to be Judaized.

In the early eighth century, the fixed Jewish calendar was not yet in existence, but various attempts were being made by Palestinian scholars to design it. There is a growing body of evidence that these first attempts were influenced by the Byzantine Easter calendar, which may in fact have been used as a model for the Jewish calendar makers.[12] The most blatant example is the 19-year cycle itself, which is still today a fundamental structure of the Jewish calendar: it was most likely borrowed from the Byzantine cycle in this period.[13] In *Pirqei deRabbi Eliezer* (ch.8), the sequence of years in the 19-year cycle is exactly the same as the Byzantine cycle. In our text, two changes have been made (see above: years 6 and 17) and this is what became the Jewish version of the cycle.

I am suggesting, therefore, that the early eighth-century author of our text may have been interested in the Byzantine cycle, and copied it out here, because of its potential for serving as the basis of, or at least an inspiration for, the creation of a similarly fixed 19-year Jewish calendar. Without resorting to any notion of 'influence', we may conceive that our author borrowed the Easter cycle as a reasonably accurate scheme that could be usefully put to the service of the Jews and their observance of Passover and other festivals at their right time.

Footnotes

1 This article was written as part of the UCL project 'Qaraite and Rabbanite Calendars', funded by the Fritz Thyssen Foundation.

2 See Sacha Stern, 'A Christian liturgical calendar in Hebrew', *Genizah Fragments* 70, October 2015; Nadia Vidro, 'Muslim and Christian calendars in Jewish calendar booklets: T-S K2.33', *Fragment of the Month*, March 2021; N. Vidro and S. Stern, 'A tenth-century Jewish correction of the Easter calendar', *Le Muséon*, 134 (3-4), 353-371.

3 Error for ז (corrected in the translation).

4 Kalends = day 1 of the month (in the Roman, Julian calendar). 'Marheshvan' etc. are not Jewish months but Julian months: Marheshvan = October, Kislev = November, etc. The text begins with October (even though the Byzantine New Year was 1 September) because 1 October is the beginning of the Byzantine 28-year cycle.

5 This is year 1 of the grand 532-year cycle (= 28 x 19) in the Byzantine tradition.

6 In the rabbinic calendar, molad designates the astronomical new moon (a point in time), on the basis of which the new month is set. The Christian calendar, however, does not have such a concept or calculation. In this context, therefore, molad probably just means the first day of the lunar month.

7 i.e. until one reaches the Julian month in which begins the lunar month that is sought.

8 A more accurate reading might be בשב]ע] ('on 7 (April)') as the lower bar of bet is visible, and maybe part of the upright. However, this reading is impossible in the context of a calendar cycle, as (among other reasons) the date for year 14 would be the same as for year 6. The reading could still be בשב]ע], but this would be a scribal error.

9 Here begins Masoret Ezra.

10 As in many Easter texts, the month names of March and April are not explicit, but this is because they are easy to identify. In any year when there is an intercalation, the Passover date is in April; in subsequent years, the date recedes by 11 days, until it falls in March.

11 Alden A. Mosshammer, *The Easter Computus and the Origins of the Christian Era*, Oxford 2008, ch. 13.

12 S. Stern, 'A Primitive Rabbinic Calendar Text from the Cairo Genizah', *Journal of Jewish Studies*, 67.1 (2016), pp. 68–90; id. 'New light on the primitive rabbinic calendars: JTS ENA 1745', *Journal of Jewish Studies*, 39.2 (2018), pp. 262–279.

13 The earliest attestation of a 19-year cycle in Jewish sources is (seventh-century?) Qaliric poetry: *Silluq* for Shabbat Rosh Hodesh, T-S 10H7.1 fol.1 recto and ms Paris AIU IV.C.489.

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