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Synchronization of the Drehem, Nippur and Umma Calendars During the Latter Part of Ur III

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§1. Introduction

§1.1. Ur III months were named using local calendars and this is useful to us today because it gives a strong indication where tablets were written. This use of local calendars would not cause undue complications if there were a simple one-to-one relationship between the months of one locality and another. However, this is not the case for two reasons.

§1.2. Firstly, different localities chose to start the year on different months, so that (prior to calendar reforms at Drehem during ŠS 3) the month of the harvest (iti še-sag_{11}-ku_5) was the 11th month at Girsu, the 12th month at Drehem and Nippur, and the 1st month at Umma and Ur.[1] The second reason concerns intercalary months. Calendars were naturally based around the lengths of solar years and lunar months. Intercalary months were introduced intermittently into calendars because a solar year is longer than 12 lunar months.[2] These intercalary months were usually inserted around the month of the harvest, and it seems reasonable to assume that this was done to ensure that the harvest occurred either during iti še-sag_{11}-ku_5 or during the intercalary month itself. However, there were only limited attempts to synchronize the use of intercalary months in different localities.

§1.3. This introduces a further source of difficulty for us because the recording of dates with intercalary months is prone to scribal error as they represent a change to the normal pattern of the calendar. The potential for scribal errors means that there can be false indications that years had (or had not) intercalary months. Therefore, one should not be misled by isolated examples.[3]

§1.4. There have been a number of papers that have considered intercalary years and calendar changes during Ur III.[4] However, the subject remains complex because usually the data have to be gleaned from a myriad of short texts, and it is not always clear whether the information in them is correct or misleading. Most of the calendar changes occurred during the reign of Šulgi, which creates difficulties because there are smaller numbers of tablets from this period compared to that following. There is a further difficulty of trying to consider too many different calendars because each would require a discussion of intercalary months before embarking on the discussion of synchronization, and the paper would become overwhelmed with detail. Therefore, this paper focuses on intercalary months and calendar changes during the reigns of Amar-Suen and Šu-Suen and the first few years of Ibbi-Suen, where there is a better understanding of intercalary years. Furthermore, this paper is restricted to the Drehem, Nippur and Umma calendars. These locations are within 60 miles of each other and so we might expect that their harvests would occur about the same time[5] and that their calendars would have been synchronized in

1 Following calendar reforms at Drehem the month of the harvest became the 7th month during Š 45-48 (Wu 2000) and then from ŠS 4 it was the first month (Whiting 1979).

2 Whiting 1979 notes that the length of a solar year is 365.2422 days and that of a lunar year is 12 × 29.53059 days; so that 19 solar years are almost exactly equal to 19 lunar years plus 7 months. On this basis, there should be 7 intercalary months in a 19-year period. This tacitly assumes that the length of months varied between 29 and 30 days so that calendar months coincided with the lunar months.

3 See, for example, Wu 2002.

4 See, for example, Cooper 1987, Gomi 1977 & 1984, Maeda 1995, Whiting 1979 and Wu 2002.

5 Whiting 1979: 23 n. 36 notes that there would have been, at most, a 3-4 week difference between the time of the harvest in the north and south of Mesopotamia.

some way. The hope is that this study will establish a firm basis for later studies that both consider other calendars and extend the discussion to include the reign of Šulgi.[6]

§2. Drehem

§2.1. The Drehem calendar has been studied more closely than those for other locations, and Whiting (1979) gives a thorough study of its leap years. He suggested that, for the period being considered in this paper, Drehem had normal (N) or leap (L) years as indicated in the following table.

AS	1	N	ŠS	1	L	IS	1	L
	2	N		2	L			
	3	L		3	N			
	4	L		4	N			
	5	N		5	L			
	6	N		6	L			
	7	N		7	N			
	8	N		8	N			
	9	L		9	N			

§2.2. There are now many more published texts identifying the positions of leap years than were available to Whiting in 1979. Nevertheless, the new data largely support Whiting's findings with two major exceptions.[7]

§2.3. Firstly, there is insufficient evidence to support the suggestion that ŠS 2 was a leap year. For example, there are about thirty examples of Drehem texts dated to, say, the month of a_2-ki-ti in ŠS 2 but only four texts that suggest there was an intercalary month.[8] Furthermore, there are six texts that specifically give annual summaries over twelve months rather than thirteen months.[9] This strongly suggests that ŠS 2 was not a leap year at Drehem. Since the two previous years, AS 9 and ŠS 1, were leap years, it seems possible that a small number of scribes fell into the error of assuming that ŠS 2 would also be a leap year.[10]

§2.4. The second point to consider is whether or not ŠS 3 should be considered a leap year. During ŠS 3/4, there was a change to the Drehem calendar. Prior to ŠS 3, the first month of the year at Drehem was iti maš-da_3-gu_7, and after ŠS 3, the first month became iti še-sag_{11}-ku_5, bringing it into line with Ur. As a consequence of this change, there was not a month iti še-sag_{11}-ku_5 during ŠS 3, since it was deemed to be the first month of ŠS 4. However, there was a 12th month in ŠS 3 that was the intercalary month iti diri ezem-me-ki-gal_2. Whiting (1979: 9-10) suggests that ŠS 3 was not a leap year because it only contained twelve months. Furthermore, he argued that if ŠS 3 were counted as a leap year, then such years would be too frequent. This became a problem for Whiting because he had assumed that ŠS 2 was a leap year.

§2.5. The issue becomes clearer if the number of intercalary months is counted rather than the number of leap years containing thirteen months. Intercalary months were added to keep the months (lunar calendar) in line with the seasons (solar calendar). Clearly, the progress of the seasons was beyond the influence of the officials, who chose to move the starting date of the Drehem calendar from one month to another. On this basis, since there was clearly an intercalary month included in ŠS 3, then it follows that ŠS 3 was a leap year (i.e. a year containing an intercalary month) even though the year only contained 12 months. Therefore, the leap years for Drehem are[11]

AS	3	ŠS	1	IS	1
	4		3		
	9		5		
			6		

§2.6. As already noted, on average there should be seven intercalary months every 19 years. Thus, we might expect to see an intercalary month approximately every three years. However, as Whiting notes, although there is some indication of such a pattern during the Šulgi years, the distribution of leap years during the following years is uneven. In particular, there are three examples of intercalary months being included in consecutive years (AS 3, 4; AS

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6 Sallaberger 1993 refers to years with intercalary months as Schaltjahre, leap years, and, since this is a useful shorthand, it will be used here.

7 There is a single Drehem tablet (*SAT* 2, 685) that appears to imply incorrectly that there was an intercalary month in AS 1. This could either be a scribal error or alternatively the year name, transliterated as mu ^{d}amar-^{d}suen [lugal], could be hiding a date other than AS 1. Similarly, there is a single tablet (*AUCT* 1, 848) that incorrectly suggests there was an intercalary month in IS 2. In this case, it seems likely that the scribe is referring to the intercalary month in IS 1 but prematurely using the year-name for IS 2. Similarly, in *AUCT* 3, 409, the scribe refers to an intercalary month in ŠS 3 but prematurely uses the year name of ŠS 4.

8 Three of these texts are dated to diri še-sag_{11}-ku_5 (*AoN* 9-17, 8 17; *OrSP* 47-49, 144; *Trouvaille* 87) and one to ezem-maḫ min_3 (*PDT* 2, 1259).

9 *BIN* 3, 325, 556; *JCS* 31, 135 4; *SAT* 3, 1268, 1273; *SET* 68.

10 *OrSP* 47-49, 144 and *Trouvaille* 87 both concern items booked out from Lu-dingira's account (ki lu_2-dingir-ra-ta ba-zi) and are part of the same archive and it is possible that they were written by the same scribe.

11 Cf. Gomi 1977.

9, ŠS 1; ŠS 5, 6).

§2.7. The position of the intercalary month within the year varies, and this is discussed at some length by Whiting (1979). During the reign of Šulgi, the intercalary month was usually iti diri še-sag$_{11}$-ku$_5$, i.e. following the 12th month. In AS 3 it was usually iti diri ezem-me-ki-gal$_2$-ke$_4$ (us$_2$-sa), following the 11th month. In AS 4 it was represented by iti ezem-maḫ min(-kam), following the 9th month.[12] Subsequently, until ŠS 2, it was usually iti diri še-sag$_{11}$-ku$_5$, once again following the 12th month. Then, when iti še-sag$_{11}$-ku$_5$ became the 1st month of the year in the ŠS 3/4 calendar change, the intercalary month became iti diri ezem-^{d}me-ki-gal$_5$, still following the 12th month of the year.[13]

§3. Garšana

§3.1. It is possible to question whether the Garšana texts use the Drehem or Ur calendar prior to ŠS 3. However, the overwhelming majority of Garszana texts are dated after ŠS 3 when the months in the Drehem and Ur calendars were aligned. Furthermore, the intercalary months in the texts listed below are consistent with the Drehem calendar.

Year	*Texts*
Šu-Suen 5	*CUSAS* 3, 153, 578, 579
Šu-Suen 6	*CUSAS* 3, 1078
Ibbi-Suen 1	*CUSAS* 3, 772, 951, 1031, 1361

§4. Nippur

§4.1. Gomi (1977) suggested that the Drehem and Nippur calendars were synchronized, implying that their leap years coincided. At that stage, he was particularly interested in providing confirmation of his findings on the calendar change at Drehem during ŠS 3/4. He cited three sources of evidence based on Nippur festivals that required livestock from Drehem. Cohen (1993: 82-83) highlighted the work of S. Oh'e (1986) who had listed a lengthy series of Drehem tablets recording the delivery of animals to Tummal for sacrifice. He also gave examples to show that the leap years at Nippur are also leap years at Drehem. Sallaberger (1993) has subsequently considered a number of other festival months at Nippur. Thus, there are two sources of relevant information: the examples of intercalation at Nippur, and the Nippur festivals that were supplied with live animals from Drehem

§4.2. The intercalary months at Nippur usually take the form iti diri še-sag$_{11}$-ku$_5$ or iti še-sag$_{11}$-ku$_5$ min. It is worthwhile briefly considering the apparent exceptions. The month name given in *Babyloniaca* 7, pl. 22 17, is iti diri? gu$_4$-si-su that is probably erroneous.[14] *TMH NF* 1-2, 66, has the month name iti diri me-ki-gal$_2$-e us$_2$-sa in the year AS 6 (or Š 42), which suggests that the tablet was probably written in Ur. This would be consistent with *UET* 3, 287 which indicates that there was a leap year in AS 6 in the Ur calendar. Furthermore, the two personal names on this tablet both appear on Ur tablets.[15] Table 1 lists the texts that identify leap years at Nippur, expanding the list provided by Cooper (1987: 179).[16,17]

Year	*Texts*
Šulgi 33	*NATN* 827
Amar-Suen 4	*NATN* 755; *TMH NF* 1-2, 69
Amar-Suen 9	*MVN* 13, 200; *NATN* 553; *NATN* p.

12 The single possible exception to this is *BRM* 3, 41, which is an annual summary. Here the scribe wrote iti maš-da$_3$-gu$_7$-ta iti diri še-sag$_{11}$-ku$_5$-še$_3$ and then, according to the drawing, appears to have corrected his error by erasing the diri. [It is interesting to note from a single example, *UET* 9, 795, that the intercalary month in the Ur calendar for AS 4 follows the 12th month.]

13 Note intercalation after the 11th month of IS 1 (instead of 12th) in *Ontario* 1, 163. Similarly, note the intercalation after 12th month of AS 1 (instead of 11th) in *Hirose* 147. In IS 1, there are two examples (possibly with the same seal impression) of Drehem tablets using iti diri as an abbreviation of the intercalary month name (*AUCT* 3, 27; *TRU* 368).

14 In the case of *PDT* 1, 404, Whiting 1979: 18 n. 23 notes, "It is easy to understand how a poorly written or partially effaced EZEM sign could be seen as diri." By extension, it is worthwhile considering whether the month name in *Babyloniaca* 7, pl. 22 17, should be read as iti ezem? gu$_4$-si-su (see, for example, *BPOA* 2, 1997 obv. 3).

15 Note also *MVN* 13, 489, which includes iti diri ezem-[...] and the Nippur month name iti du$_6$-ku$_3$. This combination of month names is difficult to explain. However, since the year is IS 1, which is a leap year in the Drehem calendar, this does not create a problem within the context of this paper.

16 *NATN* 402 is dated to an intercalary month in Š 44. Owen 1982: 32 states that this was a purchased tablet but, nevertheless, suggests its provenience was Nippur. *NATN* 402 is part of series of tablets recording Naramili and others delivering livestock for the bala on behalf of the governor of Girsu. It forms part of a series of tablets, which have month names from the Drehem calendar (Sharlach 2004: 360 chart 5.4). If *NATN* 402 was purchased during the early Nippur expeditions, then it was most likely excavated from Girsu rather than Drehem (Firth 2016).

17 The texts, *Hermitage* 3, 80 (Š 46 xii^{m}) and *CBCY* 3, p. 218 NBC 8019 (IS 7 xii^{d}) have not been published;

	54, N 680; *Ontario* 2, 420
Šu-Suen 1	*NATN* 74, 104
Šu-Suen 5	*BE* 3/1, 1; *NRVN* 1, 285
Šu-Suen 6	*BE* 3/1, 2; *NATN* 176
Ibbi-Suen 1	*MVN* 13, 489; *NATN* 108; *NRVN* 1, 168; *YOS* 4, 43
Ibbi-Suen 4	*NATN* 785; *NRVN* 1, 180[?][18]

Table 1

These are consistent with the leap years at Drehem, with the addition of a later leap year in IS 4.

§4.3. As already noted, a significant number of the Drehem tablets record livestock supplied to Nippur for festivals that are tied to specific dates in the Nippur calendar. It is possible to use these to demonstrate that the Drehem and Nippur calendars were synchronized during the reigns of Amar-Suen, Šu-Suen, and the early years of Ibbi-Suen. Appendix A lists the relevant tablets.

§4.4. Thus, the intercalated years and the festival tablets together provide a large body of data that demonstrate that the Drehem and Nippur calendars were synchronized during the period from AS 1.[19] However, it should be noted that in AS 4, the intercalation at Drehem occurred after the 9th month (iti ezem-maḫ min-kam), whilst at Nippur, more limited evidence suggests that it occurred after the 12th month. Therefore, for these few months, the two calendars were not synchronized.

§5. Umma

§5.1. Gomi (1984) considers the Umma calendar during the reign of Šulgi and proposes leap years in Š 32, 33, 36, 40, 41, 44, 46, 47, AS 2, 4 and 6. Maeda (1995) adds Š 37, 42, 43, AS 1, AS 9, ŠS 1, 3, 6, 9, IS 3 and 4. For the period from AS 1, Wu (2002) adds AS 2 and IS 1. The net result is an excessive number of leap years, particularly during the reign of Šulgi.[20] Therefore, the first step here is to reconsider the leap years for the period of interest.

§5.2. In the Umma calendar, the intercalary months were usually designated as iti diri and were positioned at the end of the year, following the 12th month (iti ^{d}dumu-zi).[21] However, scribes sometimes yielded to the temptation to combine iti diri with the name of the new year, apparently placing the intercalary month at the beginning of the new year. This is most clearly demonstrated for years with an abnormally small number of examples supporting intercalation and where a scribe has used an interim (mu us$_2$-sa) version of the year name that should not have been used once the new year name had become known. Examples are given in Table 2.[22] In particular, for *MVN* 4, 219, 225 and 242, there are indications that a scribe systematically erased the us$_2$-sa signs in the year name, suggesting that he had become aware of the mistake and corrected the error.[23]

Text	*Year Given*	*Corrected Year*
MVN 4, 219 *MVN* 4, 225 *MVN* 4, 234 *MVN* 4, 242	Š 43 / AS 7	Š 42 / AS 6
BPOA 6, 1126 *BPOA* 7, 2403	Š 45	Š 44
BIN 5, 254 *JCS* 2, 188 PTS 1274 *Nisaba* 9, 161 *SAT* 2, 596	Š 48	Š 47

however, if these dates are correct, then two points arise. First, intercalation of Nippur texts in Š 46 would not be consistent with the synchronization of the Drehem and Nippur calendars at that date, however, it would be consistent with the reconstruction of the Drehem and Nippur calendars during the later years of Šulgi proposed by Sallaberger 1993: 134-135. Secondly, intercalation in IS 7, would suggest that the Nippur calendar had intercalation in IS 1, 4 and 7, perhaps indicating that a pattern had been introduced rather than simply relying on the time of the harvest. However, this would also imply that the calendars at Nippur and Ur were not synchronized (contra Cooper 1987).

18 The year name in *NRVN* 1, 180, is given as mu en-am-gal-<an-na en> ^{d}nanna maš$_2$-e i$_3$-pa$_3$. This is a hybrid and could be either understood as IS 2: mu en-^{d}inanna maš$_2$-e i$_3$-pa$_3$ or IS 4: mu en-am-gal-an-na en-^{d}inanna ba-ḫun. Since IS 4 is an intercalary year at Nippur and Ur and IS 2 is not, then it is assumed that the year name on *NRVN* 1, 180, should be taken to imply IS 4.

19 It should not be assumed that this conclusion applies during the reign of Šulgi.

20 This is undoubtedly the source of the anomaly noted by Sharlach 2004: 27 (based on data provided by Maeda 1995) when she states that, "Over the thirty-nine year period, for which we have substantial evidence, from Šulgi 28 to Ibbi-Suen year 2, Drehem intercalated 15 times, but Umma intercalated 20 times." See also Owen 2013: 68, which lists 10 leap years in the 12 years between AS 9 and IS 2 for Umma but only 4 leap years for Girsu.

21 However, note Gomi 1984 for years prior to Šulgi 40.

22 It is convenient to include Šulgi texts in this part of the discussion. The table excludes Šulgi 33, mu us$_2$-sa si-mu-rum-um^{ki} a-ra$_2$ 3-kam ba-ḫul, since this year name was very widely used throughout the year at Umma. On us$_2$-sa years, see Dahl 2010.

23 It is also possible that the us$_2$-sa was deliberately deleted in *BIN* 5, 254.

Syracuse 283		
NMSA 3913 (unpub.)		
AUCT 3, 393	ŠS 2	ŠS 1
Nisaba 1, 184	ŠS 4	ŠS 3
MVN 13, 883	IS 4	IS 3

Table 2

§5.3. There are also examples where the intercalary month at Umma is explicitly named as iti diri še-sag$_{11}$-ku$_5$. These can be divided into three groups. The largest group consists of messenger texts listed in Table 3. It is clear that the preponderance of examples relate to AS 6 and, since this was a leap year at Umma, in these cases, it follows that iti diri še-sag$_{11}$-ku$_5$ is the 13th month of AS 6. *Nisaba* 1, 184 (ŠS 4), has already been noted in Table 2 because it used an interim (mu us$_2$-sa) year name. It was suggested that this text should have referred to the last month of the previous year. Similarly, for *Nisaba* 3/1, 141, since there is not significant evidence that AS 7 was a leap year at Umma.[24]

§5.4. The second group comprises texts that have already appeared in Table 2. In addition to *Nisaba* 1, 184, this group includes three tablets dated to Š 48: *Nisaba* 9, 161, Syracuse 283, and *SAT* 2, 596. As already suggested, these should each have been dated to the last month of the previous year.

Text	*Year*
Nisaba 1, 138	—
Nisaba 1, 158	—
Nisaba 1, 193	—
Nisaba 1, 260	—
Nisaba 3/1, 197	—
Nisaba 1, 156	AS 6
Nisaba 1, 199	AS 6
Nisaba 1, 259	AS 6
Nisaba 3/1, 111	AS 6
Nisaba 16, 234	AS 6
UMTBM 3, 8	AS 6
UMTBM 3, 16	AS 6
UMTBM 3, 64	AS 6
UMTBM 3, 78	AS 6
UMTBM 3, 83	AS 6
Nisaba 3/1, 141	AS 7
Nisaba 1, 184	ŠS 4

Table 3

§5.5. The final group consists of a small number of remaining texts, and it is worth considering these individually. The provenience of *CST* 263 (AS 3) is open to question. However, its date clearly uses the Drehem (Reichskalender) calendar, and since AS 3 is a leap year in this calendar, this is entirely consistent for the purposes of this paper. Sigrist (2004) implies that the provenience of *Ontario* 2, 310 (Š 48) is Umma, however ugula sanga ^{d}nin-gir$_6$-su also appears on seventeen texts from Girsu. Similarly, ur-^{d}ba-ba$_6$ dumu lugal-erin$_2$ also appears on five texts from Girsu. Thus, it is evident that *Ontario* 2, 310 is from Girsu, which is consistent since Š 48 is a leap year in the Girsu calendar. *AUCT* 1, 82 (ŠS 1), *BPOA* 6, 1468 (Š 37), *CHEU* 15 (ŠS 33), and *SAT* 2, 940 (AS 6) are all listed as being from Umma and there is ample evidence that the corresponding years are leap years. Thus, in these cases, iti diri še-sag$_{11}$-ku$_5$ represents the last month of the year. There is no year given in *SAT* 3, 2148, the remaining text in this category.

§5.6. In conclusion, for the period of interest, the leap years in the Umma calendar are[25]

AS	2	ŠS	1	IS	3
	4		3		
	6		6		
			9		

Thus, it is evident that the leap years at Drehem and Umma were not synchronized. However, there were continual interactions between Drehem and Umma and so the question remains whether the scribes tried to make allowance for the differences between their two calendars despite the difficulty that the intercalation was not synchronized.

§6. *Reconsidering the Month of ša$_3$ bala-a in the Umma tablets*

§6.1. The bala system obliged payments be made to the central authorities on a rotational basis. Payments from Umma extended over one month each year, and the month of the Umma bala steadily changed over successive years.[26]

§6.2. In his paper on the bala duty of the governor of

[24] For the texts in Table 3 where the years are not named, then the obvious suggestion, based on the remaining data, is that they were probably written in AS 6.

[25] There are sixty-three texts suggesting that ŠS 1 was a leap year at Umma but also eight texts suggesting the leap year was in AS 9 (as at Girsu). It is suggested that these latter texts do not reflect the presence of a leap year at Umma and seem to be pre-empting the leap year in ŠS 1. There are clearly leap years at Umma in the years AS 2, 4, 6, but again 8 texts, dated to AS 1, pre-empt the leap year in AS 2.

[26] See Maeda 1995: 148.

Umma, Maeda (1995) noted a level of correlation between the months of $ša_3$ bala-a in the Umma texts and those of bala $ensi_2$ $umma^{ki}$ in the Drehem texts. He found that, during the reigns of Amar-Suen and Šu-Suen, these appear to occur in the same month. However, in the earlier period there appears to be a discrepancy of about one month. He suggested that the discrepancy might be due to the lack of conformity between the Umma and Drehem calendars, i.e. differences in intercalation within the two calendars. One aim of this paper is to consider this question further, taking advantage of the many texts published in the twenty years since Maeda's work. The present study also has the considerable advantage of the use of the CDLI and BDTNS electronic databases.

§6.3. Appendix B (below) lists the bala $ensi_2$ $umma^{ki}$ tablets. These were all excavated unofficially, but it is widely assumed that they were found at Drehem, and they are dated using the Drehem calendar. Appendix C lists the $ša_3$ bala-a texts associated with Umma. Again, these were all excavated unofficially, but it is widely assumed that they were found at Umma. They are mostly dated using the Umma calendar, but in some cases they are dated using the Reichskalender (i.e. the Drehem calendar). Some variation has been permitted in the criterion for the tablets listed in Appendix C. Thus, Appendix C includes texts with $ša_3$ bala-a, $ša_3$ bala, $ša_3$ bala $nibru^{ki}$, $ša_3$ bala u_4 n-kam, bala u_4 n-kam.

§6.4. Table 4 sets out the months associated with the $ša_3$ bala-a and bala $ensi_2$ $umma^{ki}$ texts for each year where information is available. Although the bala for Umma is associated with a specific month, it is not unusual to find one or two $ša_3$ bala-a tablets dated in the previous or the following month; in order to avoid blurring the focus, these are not included in Table 4.

Year	*$ša_3$ bala-a (Umma calendar)*	*$ša_3$ bala-a (Reichskalender)*	*bala $ensi_2$ $umma^{ki}$ (Drehem calendar)*
IS 4	vi		
IS 3			iii
IS 2			
IS 1	iv		
ŠS 9	v		
ŠS 8			
ŠS 7	v		
ŠS 6	vi		
ŠS 5	vi		vi
ŠS 4	vi	vi	
ŠS 3	vii	vi	
ŠS 2	vii	vi	
ŠS 1	viii	vii, viii	vii
AS 9	viii	viii	viii
AS 8	viii	viii	viii
AS 7	viii	viii	
AS 6	ix		viii
AS 5	x	ix	ix
AS 4			
AS 3			
AS 2			
AS 1	i		
Š 48	i, xii		xii

Table 4 [27]

§6.5. At first sight, it is evident that, although there are some exceptions, for the most part, there appears to be a correlation of months between columns 2, 3 and 4. Thus, this confirms Maeda's finding and demonstrates that it is supported by the more recent data. However, the present, more detailed analysis requires that two other factors should be taken into consideration.

§6.6. At Umma and Ur, the month of the harvest (iti še-sag_{11}-ku_5), was the 1st month of the year. However, at Drehem, prior to ŠS 3, it was the 12th month of the year, and subsequently the calendar was reformed so that it became the 1st month of the year. Thus, for example, the alignment of month vi at Umma and Drehem in ŠS 4 & 5 can be accepted at face value, since in each case it represents the 5th month after the harvest. However, the apparent alignment of month viii at Umma and Drehem in years AS 7, 8 & 9 ignores the fact that at Umma, month viii is seven months after the harvest, whereas at Drehem it is eight months after the harvest.

§6.7. The second factor concerns leap years. As shown above, there is no evidence that there was synchronization of the leap years at Umma and Drehem during the period of interest. Thus, this is a further complicating factor that has to be taken into account when interpreting Table 4.

§6.8. Table 5 provides identical information to that in Table 4 in respect of the months, except the counting of the months for dates in the Drehem/Reichskalender are given according to the Ur calendar. This has been done so that in all cases the months are counted on the basis that iti še-sag_{11}-ku_5 is the 1st month of the year. Thus, for example, prior to ŠS 3, Drehem month viii is given as Ur month ix, and so on. The Umma months, and Drehem months following ŠS 4, are unchanged. Table 5 also in-

[27] Š 48 is included in the table because iti še-sag_{11}-ku_5 is the last month of Š 48 at Drehem and the first month of AS 1 at Umma.

cludes the intercalary months that are represented by horizontal lines.[28]

Year	*$ša_3$ bala-a (Umma calendar)*	*$ša_3$ bala-a (Reichs-kalender)*	*bala $ensi_2$ $umma^{ki}$ (Drehem calendar)*	*Phase?*
IS4	6			
IS3			3	
IS2				
IS1	4			
ŠS9	5			
ŠS8				
ŠS7	5			
ŠS6	6			
ŠS5	6		6	✓
ŠS4	6	6		✓
ŠS3	7	7		✓
ŠS2	7	7		✓
ŠS1	8	8,9	8	✓
AS9	8	9	9	×
AS8	8	9	9	×
AS7	8	9		×
AS6	9		9	✓
AS5	10	10	10	✓
AS4				
AS3				
AS2				
AS1	1		1	✓

Table 5

§6.9. Table 5 displays an additional column that indicates whether the intercalation in the Drehem and Umma calendars was 'in phase' or 'out of phase'.[29] This shows that intercalation in the two calendars is 'in phase' for AS 1, 5 & 6. At the end of AS 6, there is an intercalary month in the Umma calendar but there is not a corresponding one in the Drehem calendar until the end of AS 9. Therefore, the two calendars are 'out of phase' for AS 7, 8 & 9. Subsequently, the calendars are 'in phase' for ŠS 1, 2, 3, 4 & 5. Table 5 also shows that, where the intercalation is 'in phase,' there is agreement between the month numbers in columns 2, 3, and 4. However, where the intercalation is 'out of phase,' the numbers in columns 3 and 4, representing the Drehem calendar, are systematically one greater than those in column 2, for the Umma calendar. This demonstrates that the officials at Drehem and Umma had actively compensated for the difference in the intercalation between the two calendars.

§6.10. Thus, it has been shown that, using the data from the bala tablets, in the period following AS 1, the calendars at Drehem and Umma were synchronized manually by officials, taking account both the differences of intercalation and also the reforms in the Drehem calendar in ŠS 3. This, in itself, must have required a considerable level of organization. Pragmatically, it would have been much easier to align the calendars at Drehem and Umma than to continually have to compensate for differences. This demonstrates the importance that must have been attributed to maintaining the level of regional independence required to support local calendars.

§6.11. The situation for tablets during the reign of Šulgi is more complex for two reasons. Firstly, there are fewer data, and this necessarily increases the uncertainty in the position both of the bala months and of the leap years. Secondly, there were major calendar changes at Drehem between Š 45 and Š 48 that have the potential to create significant problems. Nevertheless, it is hoped that the clear result demonstrated above provides a firm basis from which to build.

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28 This method of representing intercalary months has been chosen because these months are almost always positioned near the beginning or end of leap years.

29 In this analysis, an initial decision was required to determine which years the Drehem and Umma calendars were 'in phase.' In practice, this was uncontroversial. Thus, the above arrangement was chosen to maximize the number of years that were 'in phase,' taking account of supporting evidence from the bala tablets.

§7. APPENDIX A

§7.1. Considering the synchronism of the Drehem and Nippur calendars

§7.1.1. A significant number of the Drehem texts record livestock supplied to Nippur for festivals that are tied to specific dates in the Nippur calendar. This appendix considers whether it is possible to use these data to show that the Drehem and Nippur calendars were synchronized.

§7.1.2. In practice, this would not be feasible if animals were delivered well in advance of a festival because that would weaken any correlation between the date of delivery and the festival. However, this Appendix will demonstrate that it is indeed possible to show that the data taken from these Drehem livestock texts are consistent with the hypothesis that the Drehem and Nippur calendars were synchronized during the reigns of Amar-Suen, Šu-Suen, and the early years of Ibbi-Suen.

§7.2. The ezem gu_4-si-su Festival in Nippur (month ii)

§7.2.1. The month, iti ezem gu_4-si-su (gu_4-si-su_2), is the second in the Nippur calendar. Gomi (1977) found that livestock were provided around the 20th day of iti ses-da-gu_7 before the calendar revision in ŠS 3, but iti-maš-da_3-gu_7 after this. These both correspond to the 2nd month of the Drehem calendar in their respective periods.[30] Sallaberger (1993: 116) extends the list by also including Drehem tablets containing the phrase e_2-ku_6-nu-gu_7 ^{d}nin-urta because it was part of the procedure that some sacrificial animals were taken to this location a few days before the festival. The following table sets out the available data.[31]

Date	*Drehem Month Name*	*Texts*
AS 1 ii	iti ses-da-gu_7	*CST* 218
AS 2 ii	iti ses-da-gu_7	*OIP* 121, 457
AS 3 ii	iti ses-da-gu_7	*SET* 60
AS 4 ii	iti ses-da-gu_7	*OIP* 121, 444; RA 49, 88 11
AS 7 ii	iti ses-da-gu_7	*CST* 355; *PDT* 1, 636; *SET* 64; *TCND* 252
AS 8 ii	iti ses-da-gu_7	*JANES* 21, 76 9; YBC 15748
AS 8 iii	iti u_5-bi_2-gu_7	*Akkadica* 114-115, 102 31 (day 5)
ŠS 1 ii	iti ses-da-gu_7	*PDT* 1, 572 ? ; *TCL* 2, 5527
ŠS 2 ii	iti ses-da-gu_7	*PDT* 1, 592
ŠS 3 ii	iti ses-da-gu_7	*OrAnt* 16, 290 5
ŠS 5 ii	iti maš-da_3-gu_7	*BCT* 1, 102; *SAT* 3, 1567
ŠS 6 ii	iti maš-da_3-gu_7	*Fs Jones* 68
ŠS 7 ii	iti maš-da_3-gu_7	*OrSP* 47-49, 42
ŠS 8 ii	iti maš-da_3-gu_7	*PDT* 1, 523
ŠS 9 ii	iti maš-da_3-gu_7	*AUCT* 3, 102
IS 2 ii	iti maš-da_3-gu_7	*BPOA* 6, 517

Thus, for the period following AS 1, the data support Gomi's finding that the Drehem texts are dated to the 2nd month of the year (with the exception of *Akkadica* 114-115, 102 31 that is dated to the beginning of the 3rd month).

§7.3. a_4-ki-ti šu-numun(-a) (month iv)

§7.3.1. These tablets include the phrase $ša_3$ a_2-ki-ti šu-numun. The table shows that animals were supplied in the 4th month of the Drehem calendar (with the single exception of *OIP* 121, 371).

Date	*Drehem Month Name*	*Texts*
AS 4 iv	iti ki-siki-^{d}nin-a-zu	*AUCT* 1, 794; *PDT* 1, 300; *TLB* 3, 98
AS 4 vii	iti ezem-^{d}šulgi	*OIP* 121, 371
AS 7 iv	iti ki-siki-^{d}nin-a-zu	*MVN* 13, 694
ŠS 1 iv	iti ki-siki-^{d}nin-a-zu	Princeton 2, 453
ŠS 8 iv	iti u_5-bi_2-gu_7	*BPOA* 7, 2599; *TMH NF* 1-2, 264

§7.4. The ezem NE-NE-gar Festival (month v)

§7.4.1. In this case, the Drehem texts tend to refer to NE-NE-gar (omitting ezem), and there is some selection of which are the relevant texts (see Cohen 1993: 101-102).

Date	*Drehem Month Name*	*Texts*
ŠS 7 v	iti ki-siki-^{d}nin-a-zu	*Kyoto* 44
IS 1 v	iti ki-siki-^{d}nin-a-zu	*MVN* 15, 118

§7.5. The Inanna Festival (month vi)

Date	*Drehem Month Name*	*Texts*
AS 7 vi	iti a_2-ki-ti	*TRU* 323

§7.6. The du_6-ku_3 Festival (month vii)

Date	*Drehem Month Name*	*Texts*
AS 1 vii	iti ezem-^{d}šulgi	*MVN* 13, 122
AS 6 vii	iti ezem-^{d}šulgi	*PDT* 2, 1286
ŠS 4 vii		YBC 16661

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30 Gomi 1977 noted a single exception, *SACT* 1, 182, with the month, iti maš-da_3-gu_7. However, this conforms to the pattern if it is dated to Š 46 rather than AS 3.

31 Cohen 1993: 85 also includes *NYPL* 348 (Š 46) and three texts from Š 47: *MVN* 15, 146; *Ontario* 1, 40; *TCL* 2, 5501. Although none of these explicitly names ezem gu_4-si-su, they are each dated to 21/22 iti ses-da-gu_7.

§7.7. The ezem ab-e_3 Festival (month x)

Date	*Drehem Month Name*	*Texts*
AS 1 x	iti ezem-an-na	*Rochester* 29
AS 3 x	iti ezem-an-na	*Kyoto* 22 ? ; *PDT* 1, 379
AS 4 ix[2]	iti ezem-maḫ min	*PDT* 1, 417
AS 6 x	iti ezem-an-na	*UDT* 177
ŠS 4 x	iti ezem-maḫ	*NATN* 914[32]

Note that in AS 4, the intercalation at Drehem occurred after the 9th month (iti ezem-maḫ min-kam), whilst at Nippur, more limited evidence suggests that it occurred after the 12th month.

§7.8. The ezem $^{na}{}_4$gug-ga-nu_2 Festival (last months of the year; cf. Sallaberger 1993: table 47)

Date	*Drehem Month Name*	*Texts*
AS 6 xii	iti še-sag_{11}-ku_5	*JCS* 14, 112 16
ŠS 1 xii	iti še-sag_{11}-ku_5	*SAT* 3, 1186
ŠS 1 xii[2]	iti diri še-sag_{11}-ku_5	*BPOA* 6, 195; *TLB* 3, 95
ŠS 3 xi[2]	iti diri ezem-me-ki-gal_2	*CT* 32, pl. 12 BM 103436
ŠS 5 xii[2]	iti diri ezem-me-ki-gal_2	*BIN* 3, 244
ŠS 6 xii[2]	iti diri ezem-me-ki-gal_2	*AnOr* 1, 25 ?
IS 1 xii[2]	iti diri ezem-me-ki-gal_2	KM 89106
IS 2 xii	iti ezem-me-ki-gal_2	*MVN* 2, 154

Based on three tablets, Sallaberger (1993: 152) suggests that there was a festival for Šu-Suen in the last month of the year. However, he notes that there are different days on the two texts cited that name specific days. Subsequently, a further text has been published (*ASJ* 16, 106 6) that is dated to the third month of the year. Thus, the evidence for the timing of ezem Šu-Suen is equivocal.

§7.9. The Tummal Festival

§7.9.1. In this case, the Drehem tablets usually do not specifically refer to a festival but instead record livestock being delivered to Tummal ($ša_3$ tum-ma-al^{ki}). However, S. Oh'e (1986) identified that these were deliveries for a festival by noting that (with few exceptions) these are restricted to Drehem month vii prior to Š 47 and month 8 from Š 47 onwards.[33]

§7.9.2. It is necessary to distinguish between items sent to Tummal for this festival and those sent for other reasons. S. Oh'e (1986) restricts the tablets to those that explicitly record the distribution (zi-ga/ba-zi) of live animals. The following list is substantially longer than that given by S. Oh'e because of the large number of tablets that have been published in more recent years. Most of the tablets adhere closely to a pattern; however, it became clear that many of the texts that diverged from this pattern contained the phrase, sa_2-du_{11} ^{d}nin-lil_2-la_2. These were therefore excluded from the table.

Date	*Drehem Month Name*	*Texts*
AS 1 viii	iti šu-eš-ša	*ASJ* 7, 123 18; *JCS* 52, 36 12; *MVN* 1, 124
AS 2 viii	iti šu-eš-ša	*OIP* 121, 6; *SACT* 1, 143; *SmithCS* 38 15; *TRU* 306
AS 3 viii	iti šu-eš-ša	*OIP* 121, 40
AS 4 viii	iti šu-eš-ša	*Hirose* 162; *RA* 9, 51 SA 195
AS 4 ix	iti ezem-maḫ	*AR RIM* 1, 22
AS 5 viii	iti šu-eš-ša	*BIN* 3, 534; *MVN* 15, 199; *ZA* 80, 28
AS 6 viii	iti šu-eš-ša	*AUCT* 1, 686; *CDLJ* 2012/1 §4.38; *SA* 26
AS 7 viii	iti šu-eš-ša	*ASJ* 4, 67 14; *CUCT* 117; *HUCA* 29, 77 6; *JCS* 39, 122 6 *MVN* 3, 235; *MVN* 15, 244; *MVN* 20, 28; *OIP* 121, 472; *PDT* 2, 1170; *SACT* 1, 160; *SumRecDreh* 17
AS 7 ix	iti ezem-maḫ	*OIP* 121, 474 (day 4)
AS 8 viii	iti šu-eš-ša	*Amorites* 19 (pl. 9); *OIP* 121, 419, 420, 421, 475; *Ontario* 1, 86; *PDT* 1, 489; *PDT* 2, 1264; *SACT* 1, 163
AS 9 viii	iti šu-eš-ša	*MVN* 15, 50; *Tavolette* 143; *Hermitage* 3, 355
AS 9 ix	iti ezem-maḫ	*Hermitage* 3, 356 (day 1); *JCS* 57, 27 3 (day 3)
ŠS 6 ix	iti ezem-^{d}šu-^{d}suen	*Hermitage* 3, 383 (day 2)
ŠS 7 viii	iti ezem-^{d}šulgi	*PDT* 1, 545; *SAT* 3, 1842; *SumRecDreh* 29
ŠS 8 viii	iti ezem-^{d}šulgi	*BPOA* 6, 818; *SAT* 3, 1856

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[32] This tablet was excavated at Nippur but uses the Drehem calendar.

[33] Cohen 1993: 82-83 identified this as the festival of du_6-ku_3 that occurred on the 27th day of the 7th month at Nippur. This is based on two tablets that record deliveries from Drehem explicitly for the du_6-ku_3 festival (Cohen 1993: 109). [These were dated AS 1 vii 27 (*MVN* 13, 122), AS 6 vii 27 (*PDT* 2, 1286). Cohen 1993: 109 also cites YBC 16661 that most probably relates to the du_6-ku_3 festival, dated ŠS 4 vii 27 of the Drehem calendar.] This assumed that the animals were delivered precisely on the day of the festival. It also places the du_6-ku_3 festival in the 7th month of the Drehem calendar in AS 1 and 6, whereas the festival identified by S. Oh'e was in the 8th month of the Drehem calendar in these years.

It can be seen that, with only a few exceptions, the above data confirm the findings of S. Oh'e.

§7.10. Thus, the overall conclusions of this Appendix are that the festival data are consistent with the proposition that the Drehem and Nippur calendars were synchronized during the period following AS 1. Furthermore, there is a reasonably close correlation between the date of delivery of the animals and the date of the festival at which they would be slaughtered. It follows that these animals were not held at Nippur for lengthy periods before festivals.

§8. APPENDIX B

§8.1. The bala ensi$_2$ umma^{ki} Tablets from Drehem[34]

Date	*Tablets*
Š 48 xii	*BCT* 1, 39; *OrSP* 47-49, 60; *SAT* 2 , 572
AS 5 ix	*BPOA* 2, 2261; *Nik* 2, 502; *TRU* 49; *UTI* 4, 2929
AS 6 viii	*JCS* 14, 112 17
AS 8 viii	*AUCT* 1, 10; *CM* 26, 138; SM 1911.10.372[35]; *MVN* 1, 113; *PDT* 2, 1240; *PPAC* 4, 180; *PPAC* 5, 1775
AS 9 viii	*Tavolette* 143; *Hermitage* 3, 355
ŠS 1 vii	*MVN* 21, 266; *MVN* 13, 482
ŠS5 vi	*UTI* 3, 2073
IS 3 iii	*NABU* 1996/131

§9. APPENDIX C

§9.1. The ša$_3$ bala-a Texts Associated with Umma[36]

Date	*Tablets*
Š 48 i	*AAICAB* 1/2, pl. 133, 1971-323; *BPOA* 2, 2164; *MVN* 15, 61; OrSP 47-49, 300; *SANTAG* 6, 88; *SANTAG* 6, 89; *SAT* 2, 570; *SAT* 2, 594; *Syracuse* 195; *UCP* 9-2-1, 57; *UTI* 3, 2257
Š 48 xii	*BPOA* 7, 2353; *CM* 26, 34; *SANTAG* 6, 96
AS 1 i	*AAICAB* 1/2, pl. 121, 1967-1497; Aleppo 428; *BPOA* 6, 471; *BPOA* 6, 611; *BPOA* 7, 2547; *Nebraska* 10; Nik 2, 193; *SACT* 2, 155
AS 5 v	*JCS* 52, 48 70
AS 5 vi	*BPOA* 7, 1876
AS 5 ix (D)	*BIN* 3, 535; *BPOA* 1, 1382; *BPOA* 2, 2372; *BPOA* 2, 2567; *BRM* 3, 139; *Chicago* 2006 119a; *TCNU* 634
AS 5 x (U)	*BPOA* 1, 1777; *BPOA* 6, 1017; *BPOA* 7, 2015; *CUSAS* 16, 279 ?; *HUCA* 29, 93 17; *MVN* 15, 334; *MVN* 18, 471; *MVN* 18, 474; *Nisaba* 9, 35; *SAT* 2, 846; *UTI* 3, 2230; *UTI* 5, 3053
AS 6 vii	*BPOA* 6, 232
AS 6 viii (D)	*AUCT* 3, 474; *BPOA* 7, 2341; *MVN* 3, 231; *SNAT* 25
AS 6 ix (U)	*AnOr* 1, 91; *BPOA* 2, 2325; *BPOA* 6, 274; *CDLJ* 2009/6 §1; *Fs Leichty* 285, 14; *JCS* 2, 185 NBC 3084; KM 89132; *MVN* 1, 239; *NYPL* 73; *RA* 49, 93 37; *SAT* 2, 934; *SAT* 2, 992; *Tavolette* 207; *UTI* 4, 2695
AS 6 xii;	*BPOA* 2, 2059
AS 7 viii (D)	B*CT* 1, 129; *MVN* 16, 1386; *NYPL* 302
AS 7 viii (U)	*Atiqot* 4, pl. 6 30; *BPOA* 1, 607; *BPOA* 1, 1071; *BPOA* 1, 1108; *CM* 26, 47; *CST* 703; *JSOR* 12, 40 23; *MVN* 4, 146; USC 6557; *UTI* 4, 2526; *UTI* 4, 2571; *UTI* 5, 3033
AS 8 vii	*UTI* 6, 3524
AS 8 viii (D)	*BIN* 3, 406; *BPOA* 6, 434; *CST* 381; Princeton 1, 236; *SACT* 1, 118; *Syracuse* 432; *UTI* 3, 1645; *UTI* 4, 2495
AS 8 viii (U)	*BPOA* 1, 1677; *BPOA* 6, 1088; *BPOA* 7, 1822; *BPOA* 7, 1884; *MCS 3*, 43 15 BM 105550; *MVN* 16, 1569; *SACT* 2, 198
AS 8 ix	*UTI* 5, 3029
AS 8 xii	*MCS* 3, 87 BM 105534
AS 9 viii (D)	*AnOr* 7, 146; *BIN* 3, 341; *BIN* 3, 381?; *BIN* 3, 383; *BIN* 3, 433; *BIN* 3, 543; *BIN* 3, 545; *BIN* 3, 549; *BIN* 3, 615; *BPOA* 1, 765; *BPOA* 1, 1191; *BPOA* 2, 2491; *BPOA* 2, 2589; *MVN* 13, 144; *MVN* 14, 488; *MVN* 16, 786; *MVN* 16, 803; *MVN* 16, 806; *MVN* 16, 1413; *MVN* 16, 1447; *MVN* 16, 1474; *PDT* 2, 1367; *SNAT* 430; *UTI* 3, 1626; *UTI* 3, 1663; *UTI* 4, 2320; *UTI* 4, 2427; *UTI* 4, 2714; *UTI* 4, 2813; *UTI* 6, 3806; *UTI* 6, 3807
AS 9 viii (U)	*BPOA* 2, 2295; *BPOA* 2, 2624; *MVN* 14, 311; *MVN* 16, 1441; *Princeton* 1, 376; *UTI* 3, 1604; *UTI* 4, 2982; *UTI* 5, 3137; *UTI* 5, 3154; *UTI* 6, 3657
AS 9 ix	*ASJ* 15, 77 3; *UTI* 3, 1667
ŠS 1 vii (D)	*UTI* 3, 2216[37]
ŠS 1 vii	*BPOA* 2, 2299
ŠS 1 viii (D)	*ASJ* 16, 111 17, *UTI* 4, 2621
ŠS 1 viii (U)	*AAICAB* 1/4, Bod S 568; *BPOA* 1, 480; *BPOA* 1, 1492; *BPOA* 1, 1668; *BPOA* 2, 2137; *BPOA* 2, 2223; *BPOA* 6, 449; *BPOA* 6, 1474; *BPOA* 7, 2060; *JCS* 2, 191 PTS 1210; KM 89194; *MCS* 3, 43 10 BM 105485; *MVN* 13, 379; *MVN* 14, 364; *MVN* 16, 1088; *MVN* 16, 1356; *MVN* 16, 1383; *MVN* 16, 1406; *MVN* 16, 1508; *Princeton* 1, 150; *SACT* 2, 190; *UTI* 3, 1606; UTI 3, 1981; *UTI* 4, 2405; *UTI* 4, 2572;

[34] Excluding tablets earlier than Š 48.

[35] Sharlach 2004: 344..

[36] Excluding tablets earlier than Š 48.

[37] Or ŠS 1 x using the Umma calendar.

	UTI 4, 2626; *UTI* 4, 2631; *UTI* 4, 2664; *UTI* 4, 2827; *UTI* 4, 2939; *UTI* 6, 3571+; *UTI* 6, 3634
ŠS 1 ix	*BPOA* 7, 2176
ŠS 2 i	*BCT* 2, 225
ŠS 2 vi (D)	*MVN* 14, 426; *SANTAG* 6, 235; *SA*T 3, 1312
ŠS 2 vii (U)	*BPOA* 2, 2244; *BPOA* 2, 2510; *BPOA* 6, 285; *MVN* 14, 317; *MVN* 14, 422; *MVN* 14, 507; *MVN* 16, 1067; *MVN* 16, 1098; *MVN* 16, 1137; *MVN* 16, 1389; *SANTAG* 7, 25; *UTI* 3, 1634; *UTI* 4, 2678; *UTI* 4, 2798
ŠS 3 iv	*BPOA* 1, 1267
ŠS 3 vi (D)	*BPOA* 1, 1574; *BPOA* 2, 2247; *MVN* 16, 890; *PDT* 2, 1346; *PDT* 2, 1372; *SACT* 1, 121; *SAT* 3, 1379
ŠS 3 vii (U)	*AnOr* 1, 61; *AnOr* 7, 236; *BPOA* 1, 768; *BPOA* 1, 1712; *BPOA* 1, 1713; *BPOA* 6, 351; *BPOA* 6, 506; *BPOA* 6, 1397; *MVN* 16, 1339; *MVN* 16, 1407; *MVN* 21, 167; *Orient* 16, 72 101; *SAT* 3, 1362; *SAT* 3, 1388; USC 6568; *UTI* 4, 2451; *UTI* 4, 2511; *UTI* 4, 2611; *UTI* 4, 2656; *UTI* 4, 2701
ŠS 4 vi	*AAS* 156; *AnOr* 1, 199; *BJRL* 64, 107 49; *BPOA* 1, 374; *BPOA* 6, 837; *BPOA* 7, 2546; *MVN* 14, 356; *MVN* 14, 539; *MVN* 16, 845; *MVN* 16, 1138; *MVN* 16, 1200; *MVN* 16, 1583; *Nik* 2, 216; *Nik* 2, 228; *Nik* 2, 234; *PDT* 2, 1348 (D); *SANTAG* 6, 273; *SANTAG* 6, 275; *SANTAG* 6, 278; *SAT* 3, 1433; *SAT* 3, 1442; *SAT* 3, 1471; *SAT* 3, 1485; *UTI* 3, 1915; *UTI* 4, 2457
ŠS 4 vii	*BPOA* 1, 1163
ŠS 5 vi	*Babyloniaca* 8, pl. 5 Pupil 16; *BCT* 2, 16; *BPOA* 6, 135; KM 89299; *MVN* 14, 385; *MVN* 14, 535; *MVN* 16, 808; *MVN* 16, 881; *MVN* 16, 1009; *MVN* 16, 1095; *MVN* 16, 1099; *MVN* 16, 1154; *MVN* 16, 1361; *UTI* 3, 1818; *UTI* 3, 2205; *UTI* 4, 2418; *UTI* 6, 3532+; *UTI* 6, 3813
ŠS 6 vi	*BPOA* 7, 2754; *CM* 26, 57; *MVN* 13, 758; *MVN* 16, 1266; *Nik* 2, 235; *Ontario* 2, 327; *SAT* 3, 1664; *SAT* 3, 1674
ŠS 7 v	*BPOA* 6, 262; *CST* 704; USC 6746; *UTI* 4, 2500
ŠS 9 v	*BPOA* 1, 1088; *BPOA* 1, 1338; MS 2019/9; *Nisaba* 23, 43; *Umma* 60
IS 1 iv	*BPOA* 1, 733; *BPOA* 1, 1324; *BPOA* 2, 2349;*JCS* 35, 207 4; *MVN* 3, 301; *Nisaba* 9, 165
IS 4 vi	*SAT* 3, 1405

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