

Revisiting Jemdet Nasr Texts: IM 55580+
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§1. The tablet IM 55580 was first published in copy by S. Langdon in *OECT* 7 (Oxford 1928, as no. 32 plus fragment no. 187, and no. 128, a field copy. The tablet is broken in many pieces, of which at least five have been assembled; photographs of the obverse and reverse as well as copies and transliteration were published by R. K. Englund and J.-P. Gregoire in 1991 (*MSVO* 1, 94). The tablet measures 113×71×20 mm, missing the upper left corner and a trapezoidal-shaped portion of the obverse that extends from the left edge to the center dividing line. The lower left side of the obverse is badly abraded with the consequent loss of, probably, three cases in the bottom of the first column.

§2. One of the missing fragments can now be identified with IM 132921 (*OECT* 7, 153 = *MSVO* 1, 124). The fragment measures 30×34×18 mm and has a trapezoidal shape that matches one of the missing sections of the tablet. Since the tablet is in the Iraq Museum in a very unstable Baghdad, a physical join can for the time being not be completed, but should be considered very close to certain. A join based on photographic evidence is presented in figure 1. The small piece that extends from the upper rear side of the fragment has been eliminated to avoid undue overlapping of the front side of the tablet. This was not necessary when joining the fragment on the reverse of the tablet, since in this case the overlapping is correct.

§3. The join restores partially the second (O0102) and third cases (O0103) and almost completely the fourth case (O0104) of the first column of the obverse. The fragment restores also the first part of the second column of the obverse. The reverse of the fragment is badly damaged, preserving only a portion of a sign belonging to the first case of the second section (R0102a). It can be seen that in O0104 the upper right edge of the tablet matches perfectly the lower left

edge of the fragment, fully restoring the number sign N_1 , the sign $\check{S}U_2$ and the line separating the preceding case O0103.

§4. Some more fragments and flakes are still missing in order to restore completely the tablet. Nevertheless, the content of some missing cases can be determined by analogy, although no quantitative integration may be reliably attempted.

§5. The transliteration of the text follows that provided in *MSVO* 1, the only differences being the inclusion of the signs on the fragment and the reading $8N_1$ in case O0303 instead of $9N_1$; this follows from a comparison of cases O0105 and O0307, in which the two signs furthest to the right end vertically aligned (as normally happens for even numbers and not for odd numbers, for instance in case O0305).

O0101	[...]
O0102	[...] $\ulcorner 4N_3 \urcorner$
O0103	[...] $\ulcorner 2N_{14} \urcorner$ UDU _a
O0104	$2N_{14}$ $4N_1$ $\check{S}U_2$
O0105	$8N_a$ ZATU644 _a
O0106	[...] X [...]
O0107	[...] [...]
O0108	[...] [...]
O0109	$\ulcorner 8N_1 \urcorner$ [...] $\ulcorner BU_a \urcorner$ [...]
O0201	GIR _{3b} gunû $\ulcorner PA_a$ AMAR \urcorner GI N_a +RU AB _a $\ulcorner 6N_1 \urcorner$ SU _a [GIBIL]
O0301	$4N_{20}$ $2N_5$ $2N_{42a}$
O0302	$2N_{18}$
O0303	$\ulcorner 8N_1 \urcorner$ UDU _a
O0304	$2N_{52}$ $1N_{38}$ $\ulcorner 5N_{21} \urcorner$
O0305	$9N_1$ $\check{S}U_2$
O0306	$3N_1$ ZATU644 _a
O0307	$8N_1$ DUR _b NUNUZ _{a1}
O0308	$1N_{14}$ $2N_1$ SU _a GIBIL GI
O0401	GIR _{3b} gunû PA _a PAP _a BU _a NAM ₂

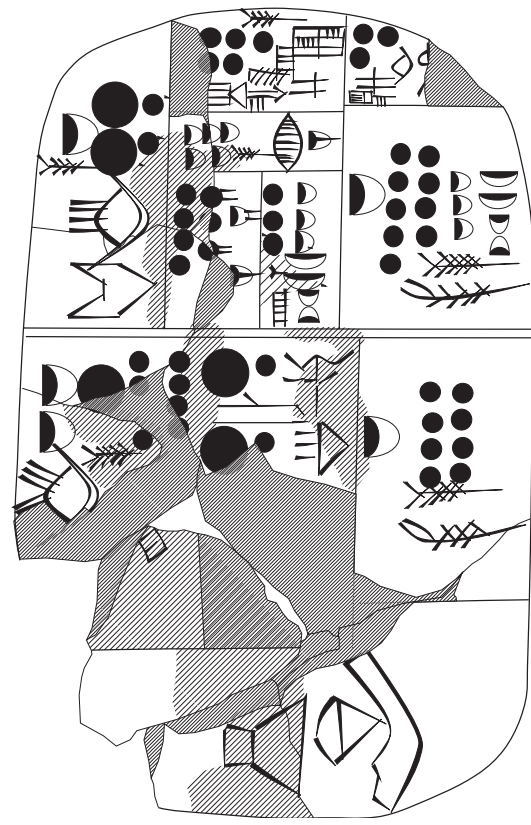
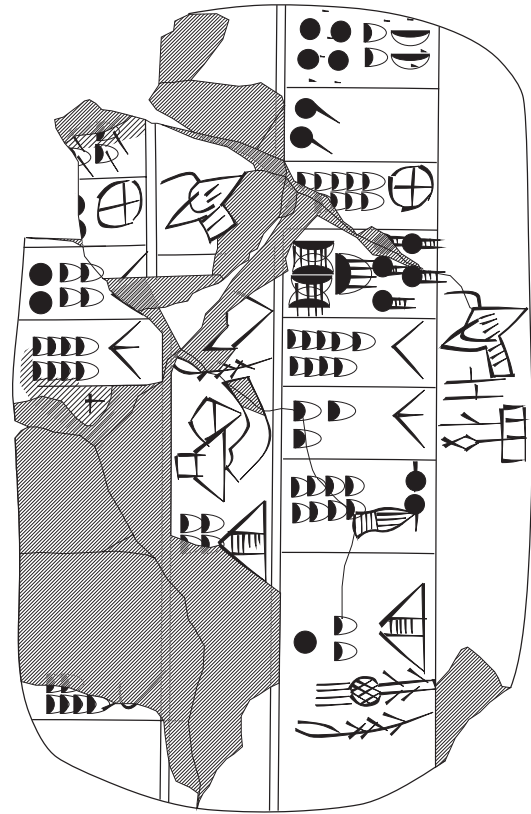


Figure 1: Obverse and reverse surfaces of the tablet MSVO 1, 94 showing photographic join with fragment MSVO 1, 124 (left), and a reconstructed vector graphic of both texts (right, courtesy of R. K. Englund).

R0101a	1N ₃₇ 2N ₄₇ 2N ₂₀ ŠE _a U ₄ +4N ₅₇ AMAR
R0101b1	┌ 5N ₁₄ ┐ ŠE _a KID _a EN _a ┌ KALAM _a ┐ PA _a
R0101b2	5N ₁ ŠE _a KI _a 1N ₂
R0101b3a	┌ 7N ₁₉ ┐ 1N ₄ [...] ┌ 1N ₂ ┐
R0101b3b	3N ₂₀ 3N ₅ 2N _{42a} 1N ₂₅ X ŠE _a
R0101b4	3N ₁₄ PA _a U ₄ KALAM _b ┌ MÜŠEN? ┐ X [...]
R0101b5	1N ₃₄ 9N ₁₄ 3N ₁ 2N _{39a} 1N ₂₄ ŠE _a GI
R0102a	2N ₃₄ 1N ₄₅ ┌ 8N ₁₄ U ₄ +6N ₅₇ ŠE _a GIR _{3b} gunû ┐ [...]
R0102b1	1N ₄₅ 1N ₁₄ PAP _a X
R0102b2	1N ₄₅ 1N ₁₄ 3N ₅₇ ┌ SAL ┐ [...]
R0102b3	[1N ₄₅ 8N ₁₄ ...]
R0102b4	1N ₃₄ 8N ₁₄ ŠE _a GI
R0103	[...] ┌ AB _a ┐ NI _a +RU

§6. The text is composed of four sections. Two sections contained on the obverse list grain and other food commodities delivered (GI) to officials, and are characterized by the formulae 6N₁ SU_a GIBIL and 1N₁₄ 2N₁ SU_a GIBIL, respectively. The two sections in the reverse surface of the tablet are accounts of grain (ŠE₁) with totals and partial details accounted over a period of 4 years (U₄+4N₅₇) and 6 years (U₄+6N₅₇), respectively.¹

§7. The numerical sign systems used in the list of commodities on the obverse (sections 1 and 2) include both the bisexagesimal system and the ŠE system.² Sections 3 and 4 in the reverse, being accounts of grain, use only the ŠE system.

§8. The first section, in analogy to section 2, should contain in case O0101 a quantity of grain measured in the derived numerical system Š*, followed by an additional quantity expressed in the derived system Š' (case O0102).³ Similarly, a commodity measured in the derived numerical system B* used to qualify discrete objects is probably to be expected in one of

the missing cases O0106 – O0108. The deliveries (GI) of the listed commodities, ‘regular offerings due to the temple’? (NI+RU AB_a),⁴ took place six times (┌ 6N₁ ┐ SU_a [GIBIL]),⁵ the two officials GIR_{3b}gunû PA_a and AMAR⁶ being responsible for the transactions. The use of the regular sexagesimal system (as in the section 2) in the expression for “six times” in place of the N₅₇ notation is probably meant to qualify the notation as a cardinal number. N₅₇ notations, frequently used for ordinal numbers, are also used for cardinal numbers, especially when there is no possible ambiguity in interpretation, as in texts *MSVO* 4,1 and 2, discussed in §15, which list grain accounts for 8 years in sequence (1N₅₇ to 8N₅₇ used as ordinals in the time-notation U₄+nN₅₇) and record the total amount of grain for the 8-year period (8N₅₇ used as cardinal in the same time-notation).

on *Ancient Near Eastern Mathematics* (=BBVO 19; Berlin 2001) 11-13.

⁴ R. K. Englund, *BBVO* 19, 19, suggested a more attractive interpretation of the term NI_a+RU as toponym denoting the town of Jemdet Nasr. Since conclusive evidence for this interpretation is still lacking, however, I would prefer to maintain as an alternative my interpretation based on the assumption that the term may represent a standard administrative formula (possibly a verbal form) to be compared with the later a-mu-ru (but see also nig₂-a-ru ezem še gu₇ in *VS* 14, 013 and nig₂-a-ru ezem munu₄ gu₇ in *DP* 72, both texts from ED IIIb Lagash: for the expression NI_a+RU + month name see the following note).

⁵ R. K. Englund, *JESHO* 31, 146, states “the notation 3N₅₇+U₄ SU_a 6[+] N₁ GIBIL ┌ NI+RU ┐ in *OECT* 7, 134 (...) suggests that the numerous parallel notations XN₅₇ SU_a GIBIL ... in the JN corpus are all to be understood as notations for ‘years’”. In my opinion, the notation nN₅₇ SU_a GIBIL (GI) refers to specific grain deliveries, with nN₅₇ used prevalently as ordinals, while the use of notation nN₁ (cardinal numbers) denotes the frequency of grain deliveries in a specified time period (the notation in text *MSVO* 1, 90 (= *OECT* 7, 134) should consequently be rendered as “6’ deliveries over a period of 3 years, regular offerings of ...”, with the sign GI to be restored in the broken part of the case before ‘NI+RU’). If Englund’s interpretation of SU_a GIBIL as a month name is correct (*BBVO* 19, p. 21), then deliveries of such offerings took place regularly in a fixed period of the year.

⁶ The restoration of case O0201, based on its similarity with case O0401, ensures that AMAR is the name of the second official in charge of the transaction and therefore does not denote the recipients (“calves”) of the grain. For the reference daily unit of grain for each official, see note 9 below.

¹ For the time notations used in the Uruk III period, cf. R. K. Englund, “Administrative Timekeeping in Ancient Mesopotamia,” *JESHO* 31 (1998) 121-185.

² For a detailed discussion of the numerical systems in use in ancient Mesopotamia, see P. Damerow and R. K. Englund, “Die Zahlzeichensysteme der Archaischen Texte aus Uruk,” in M. W. Green and H. J. Nissen, *Zeichenliste der Archaischen Texte aus Uruk* (=ATU 2; Berlin 1987) 117-166.

³ These products are grain groats and malt, respectively (i.e., beer ingredients), according to R. K. Englund, “Grain Accounting Practices in Archaic Mesopotamia,” in J. Höystrup and Peter Damerow, eds., *Changing Views*

	<i>Accounting System</i>	<i>Quantity</i>	<i>Commodities</i>
O0101	Š*	[...]	[ŠE]
O0102	Š'	[...] 4	
O0103	B	[X+]² 20	UDU _a
O0104	B	24	ŠU ₂
O0105	B	8	ZATU644 _a
O0106	B	[...]	?
O0107	B	[...]	?
O0108	B	[...]	?
O0109	B	8	?

§9. Section 2 consists of a fully preserved list of commodities delivered twelve times (1N₁₄ 2N₁ SU_a GIBIL GI), the two officials GIR_{3b}gunû PA_a and PAP_a BU_a NAM₂ being in charge of the transaction. Similar lists of commodities are common in Jemdet Nasr texts.⁷ In this category of accounts, the list always begins with a quantity of grain measured in the derived numerical system Š*, followed by an additional quantity expressed in the numerical system Š'. The other commodities are recorded in the numerical system B, with a quantity measured in the derived system B*.

	<i>Accounting System</i>	<i>Quantity</i>	<i>Commodities</i>
O0301	Š*	26 2/5	[ŠE]
O0302	Š'	12	
O0303	B	8	UDU _a
O0304	B*	350	
O0305	B	8	ŠU ₂
O0306	B	3	ZATU644 _a
O0307	B	8	DUR _b NUNUZ _{a1}

§10. Section 3 is a grain account over a period of 4 years (the considerations of the following paragraphs presume that the numerical signs nN₅₇ used in the time notations in sections 3 and 4 may be regarded as ordinals). The first case (R0101a) reports the total amount of grain measured in the numerical system Š*, the official in charge being AMAR. Cases R0101b1–R0101b5 record the details of partial deliveries, with the purpose of each transaction specified. Cases R0101b3a – R0101b3b demonstrate the equivalence between emmer (ZIZ₂?) and grain in the ratio 2:1. Quantities of grain measured in both Š and Š* systems are reckoned together in the Š* system (case R0101a). The average yearly delivery of grain amounts to 78N₁ (units of grain, corresponding to later Sumerian barig?) equivalent to 13N₁₄ (units of grain, corresponding to later Sumerian gur?).⁸

⁷ See for instance *MSVO* 1, 95, 96, 97, 99, etc.

⁸ For practical reasons, all grain measurements refer to the N₁ units, denominated barig following P. Damerow and R.K. Englund, *ATU* 2, 153-154, n. 60.

	<i>Accounting System</i>	<i>Quantity</i>	<i>Commodities</i>
R0101a	Š*	312	ŠE
R0101b1	Š	30	ŠE
R0101b2	Š	5	ŠE
R0101b3a	Š''	(43)	ZIZ ₂ ?
R0101b3b	Š*	21 1/2	ŠE
R0101b4	Š	18	[ŠE]
R0101b5	Š	237 1/5	ŠE

§11. Section 4 is a grain account over a period of 6 years, in which both the total and the partial deliveries are measured in the numerical system Š. The official in charge is GIR_{3b}gunû PA_a (only a portion of the first sign is preserved in the joined fragment). As in Section 3 the first case (R0102a) reports the total amount of grain, while cases R0102b1-R0102b4 accounts partial deliveries which are exact multiples of 6. Such circumstance confirms that the average yearly delivery of grain (78 barig or 13 gur) found in section 3 was the standard yearly rate for the recorded transactions.

	<i>Accounting System</i>	<i>Quantity</i>	<i>Commodities</i>
R0102a	Š	468	ŠE
R0102b1	Š	66	[ŠE]
R0102b2	Š	66	[ŠE]
R0102b3	Š	[108]	[ŠE]
R0102b4	Š	228	ŠE

§12. It is noteworthy that the text *MSVO* 1, 90, reports regular supplies of grain, delivered 6 times, to the same officials GIR_{3b}gunû PA_a and AMAR for an total of 237 3/5 (barig) over a period of 3 years, resulting in an average yearly rate of 79 1/5 (barig).⁹ *MSVO* 1, 89, is an account of grain for the officials GIR_{3b}gunû PA_a and EN_a PA_a BAD+DIŠ_a over a period of 3 years, in 4 deliveries¹⁰, for a total amount of 118 4/5 (barig) equivalent to an average yearly rate of 39 3/5 (barig), corresponding to half of the standard quantity.

§13. We have already noted in §9 that section 2 records an amount of grain (26 2/5 bariga) delivered 12 times to two officials. If we observe that

⁹ The standard year quantity of 39 3/5 bariga corresponds to a daily quantity of 1/10 bariga (N₂₄) with the addition of 10% (TAR_a) as clearly indicated in the text *MSVO* 1, 121 (= *OECT* 7, 84). See R.K. Englund, *JESHO* 31, 150-160 for commentary to this and similar texts discussed in the present paper.

¹⁰ The regular supply of 118 4/5 ÷ 4 = 29.7 barig, corresponding to 27 barig after subtraction of 10% (TAR_a), results in an expected value of 4N₂₀ 3N₅ in case O0401. The obverse of the tablet is badly damaged and requires more collation for confirmation.

year	quantity	MSVO 4,1		MSVO 4,2	
		(n×78)	(n×26 ² / ₅)	(n×78)	(n×26 ² / ₅)
1 (U ₄ +1N ₅₇)	156	2		168	2 ² / ₁₃
2 (U ₄ +2N ₅₇)	114	1 ⁶ / ₁₃		102	1 ⁴ / ₁₃
3 (U ₄ +3N ₅₇)	90	1 ² / ₁₃		132	1 ⁹ / ₁₃
4 (U ₄ +4N ₅₇)	48	8 ⁸ / ₁₃		48	8 ⁸ / ₁₃
5 (U ₄ +5N ₅₇)	36	6 ⁶ / ₁₃		30	5 ⁵ / ₁₃
6 (U ₄ +6N ₅₇)	48	8 ⁸ / ₁₃		30	5 ⁵ / ₁₃
7 (U ₄ +7N ₅₇)	42	7 ⁷ / ₁₃		108	1 ⁵ / ₁₃
8 (U ₄ +8N ₅₇)	126	1 ⁸ / ₁₃		54	9 ⁹ / ₁₃
Total for 8 years	660		25	660	25

Table 1: Obverse and reverse surfaces of the tablet IM 55580 showing photographic join with fragment IM 132921 (left), a reconstructed vector graphic of both texts (right, courtesy of R. K. Englund).

$$26 \frac{2}{5} \times 12 = 316 \frac{4}{5} = 4 \times 79 \frac{1}{5} = 4 \times 39 \frac{3}{5} \times 2,$$

it follows that the two officials (GIR_{3b}gunû PA_a and PAP_a BU_a NAM₂) received the yearly standard amount of grain over a period of 4 years. By analogy, section 1 may have recorded the same amount of grain (26²/₅ barig), delivered 6 times to the officials GIR_{3b}gunû PA_a and AMAR, for an equivalent of 158²/₅ barig over a period of 2 years.¹¹

§14. Absent evidence for the amount of grain in the missing case O0101, no certain conclusion can be drawn about the relationships among sections 1 and 2, and sections 3 and 4. Under the assumption that the account in section 4 included the quantity of grain recorded in section 3, and hence that there is no unambiguous relationship between any single section on the obverse and the reverse of the tablet, a calendrical relationship between the frequency of deliveries reported in section 1 and 2, and the total period of the grain accounting of section 4 can be assessed by similarity with other textual evidence, for which see presently.

§15. It may not be surprising to find the same correspondence between the standard quantity of grain for each delivery to the officials in charge (26²/₅ barig) of sections 1 and 2, and the yearly standard amount (78 barig) recorded in the totals of sections 3 and 4, also in the parallel texts MSVO 4,1 and 2, from Uqair

(a Sumerian town not far from Jemdet Nasr).¹² Table 1 lists for each year the quantity of grain measured in barig, the same quantity expressed in terms of the standard yearly amount (78 barig), and the quantity for the total period in terms of the standard quantity per delivery/official (26²/₅ barig).

§16. Such relationships in both texts seem to imply that 25 deliveries of the standard quantity (26²/₅) took place over a period of 8 years, at a variable yearly rate, computable in terms of ⁿ/₁₃. If we consider the ratio between the average yearly rate of 79¹/₅ barig for two officials (§13) and the standard yearly amount of 78 barig for the same officials (§10), and multiply it by the number of days for the standard year (360) we get:

$$79 \frac{1}{5} \times 360 \div 78 = 365 \frac{1}{2}$$

which is a very close approximation of the duration of the solar year. This knowledge is not quite surprising for a population dependent on agriculture and implies the early introduction of the intercalary (13th) month, a direct consequence of having adopted a calendar with a month of fixed duration (30 days).¹³ We may therefore assume that the grain deliveries were performed, on average, three times per year, plus once to take into account the intercalary month (3 × 8 + 1 = 25), whereas the actual transactions involved were those registered in the tablets for each year.

¹¹ Regular supply of the standard 26.4 bariga (including the additional 10%) for 4 years is found in MSVO 1, 119 = OECT 7, 2).

¹² Analogous supply of the standard 26²/₅ barig (including 2²/₅ barig qualified as TAR_a) is also found in another fragmentary text from Uqair, MSVO 4, 27.

¹³ R. K. Englund (JESHO 31, 159) has already suggested the possible existence of the intercalary month in connection with the grain/time notations reported in the reverse of MSVO 1, 94, although he attributes the resulting yearly amount of 78 barig as due to “an increase of the daily grain unit N_{39a} ... not by the usual factor of ¹/₁₀, but rather by ¹/₁₂”.