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Mathematical cuneiform tablets in the Ashmolean Museum, Oxford

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For Roger Moorey, with thanks

Contents

Introduction

I learned how to copy cuneiform tablets in the Ashmolean Museum, under the watchful eye of my teacher and then colleague Stephanie Dalley and the kindly but more distant oversight of Roger Moorey, the Ashmolean's Keeper of Antiquities and my erstwhile college advisor. As Roger celebrates his retirement and Stephanie and I prepare the latest volume of *Oxford Editions of Cuneiform Texts* (*OECT*) before I leave Oxford for another place, it seems fitting that I should dedicate this edition of forty-one mathematical and metrological tablets to Roger, who has done so much for the museum and for the ancient Near East at large.[1] Those tablets, apparently systematically ignored throughout the *OECT* publication history, span most of the history of cuneiform writing, from the turn of the fourth millennium to the middle of the first millennium. Over half of them stem from the Oxford-Chicago excavations in the city of Kish during the 1920s and, as will become clear, Roger's reworking of the old dig records and republication of the site (Moorey 1978), together with the late Oliver Gurney's card catalogue of the Kish tablets, has allowed many of them to be archaeologically contextualised here. Using this information along with recent work on the typology of school and mathematical tablets from Nippur and other sites (Veldhuis 1997; Tinney 1999; Gesche 2001; Robson 2001*b*; 2002) means that in many cases it is possible to do more than describe the often trivial mathematical information they contain but to start to locate them functionally within their original settings, and sometimes even to extract extraordinarily specific information about the circumstances of their composition.

For instance, **Tablets 2–3**, in conjunction with a similar tablet in the Yale Babylonian Collection, together provide the first direct evidence for the duration of learning any Old Babylonian scribal exercise at all, not just mathematics. These three multiplication tables, all written and dated by the same trainee scribe, suggest that the entire series of reciprocals and multiplications was learned little by little over the course of a year, presumably at the same time as other elementary exercises. **Tablets 1 and 5** also give the names of their authors — further small but important clues to the identification of individual actors in the overwhelmingly anonymous historical record.

Tablet 9 is the republication of an important metrological list which confirms that there were in fact two sets of linear measures: one for horizontal lengths, the other for vertical heights. **Tablet 14** is an interesting new problem on 'striped triangles' dressed up as a question about furrowed fields. **Tablets 15–26**, together with some thirty tablets published many years ago in *PRAK* and *MKT*, enable a first attempt to delineate the characteristics of mathematics at Kish in the Old Babylonian period, providing a useful counterpart to the better known and more southerly Nippur. Perhaps most importantly, though, **Tablets 27–41** are witnesses to mathematical education in the early first millennium BCE, a period much neglected in the intellectual history of ancient Iraq. In particular **Tablet 28** includes the earliest known use of an intermediate place-holder 'zero' sign. A first attempt is made at reconstructing the contents of the seventh-century library at Kish.

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[1] I am also pleased to thank Dr Helen Whitehouse and Dr Christina Riggs for their oversight of the collection and their willing accommodation of me in the tablet room. The two anonymous referees caught several small slips and oversights; for their careful reading I am very grateful.

Catalogue

Tablets are listed here in order of their museum numbers. The final column gives the order of publication here.

Museum number	*Measurements*[2]	*Period*[3]	*Provenance*	*Description and publication*	*No.*
1921.1154	—	MB	El-Amarna, Egypt. Found in private house	Egyptian-Akkadian vocabulary, including metrological conversion. Copy and edition: Izre'el (1997: EA 368).	—
1922.168	d. 82 × 20	OB	Larsa?	School tablet, type IV: geometrical diagram and calculation. Copy and edition: Robson (1999: 273–4)	8
1922.178	74* × 48 × 20	OB	Larsa?	School tablet, type III: multiplication table × 25, with colophon	1
1923.318	84* × 45 × 23	OB	Larsa?	School tablet, type III: multiplication table × 8	6
1923.366	—	OB	Larsa?	School tablet, type P (prism): two metrological tables of length and height; table of inverse squares and inverse cubes. Copy: *OECT* 4: 156	9
1923.410	82 × 48 × 23	OB	Larsa?	School tablet, type III: metrological table of weights	10
1923.414	50 × 38 × 20	OB	Larsa?	School tablet, type III: metrological table of areas. Copy: *OECT* 15: 138	11
1924.447	80 × 46 × 24	OB	Larsa?	School tablet, type III: multiplication table × 24, cf. 1924.451. See too *MCT* no. 99,13b. Copy: *OECT* 15: 143	2
1924.450	74 × 45 × 21	OB	Larsa?	School tablet, type III: multiplication table × 12. Copy: *OECT* 15: 144	4

[2] All measurements are given in millimetres in the order length — width — thickness. Incomplete measurements are marked with an asterisk. Diameters of round tablets are marked 'd'.

[3] JN = Jemdet Nasr, c.3000 BCE; MB = Middle Babylonian, c. 1350 BCE; NB = Neo-Babylonian, c.750–500 BCE; OAkk = Old Akkadian, c. 2300 BCE; OB = Old Babylonian, c.1900–1600 BCE.

Museum number	*Measurements*	*Period*	*Provenance*	*Description and publication*	*No.*
1924.451	81 × 41 × 23	OB	Larsa?	School tablet, type III: multiplication table × 24, cf. 1924.451. Copy: *OECT* 15: 145	3
1924.457	70 × 41 × 23	OB	Marad	School tablet, type III: multiplication table × 7;12 Copy: *OECT* 13: 5	7
1924.472	78 × 47 × 19	OB	—	School tablet, type III: multiplication table × 10, with colophon	5
1924.564	64* × 65* × 30*	OB	Kish, HMR 290W. Uhaimir house ruins, 2 m below surface	School tablet, type I or II/2: metrological list of capacities. Copy: *OECT* 13: 35	23
1924.573	48* × 35* × 25	OB	Kish, HMR 311W. Uhaimir, house ruins, 2 m below surface	School tablet, type III: multiplication table × 4;30	20
1924.586	40* × 47* × 33	OB	Kish, HMR 178. Uhaimir, temple area, SE side of platform, room 5, 1 m below brickwork	School tablet, type IV: calculation. Copy: *OECT* 15: 149	21
1924.590	18* × 35* × 18	OB	Kish	School tablet, type III: reciprocal table, with colophon	15
1924.620	d. 75* × 30	OB	Kish, HMR 295W. Uhaimir house ruins	School tablet, type IV: tabular calculation. Copy: *OECT* 13: 64	22
1924.689	49 × 43 × 16	OAkk	—	Square tablet: setting of two problems on areas of squares. Photo and edition: *MAD* 5: 112 & pl. XLIII	—
1924.796+2194 +1931.38	165* × 86 × 25	NB	Kish	Long tablet: table of squares, with 'firing holes' and colophon	28
1924.1048	64* × 39*	NB	Kish. Returned to Baghdad	School tablet, type 1: S^b A, metrological list (capacities). Copy: *OECT* 4: 127	30
1924.1098+1389	100* × 60*	NB	Kish. Returned to Baghdad	School tablet, type 1b′: obverse S^b A; reverse metrological list (capacities); spellings. Copy: *OECT* 4: 75 (1924.1098)	34

Museum number	*Measure-ments*	*Period*	*Provenance*	*Description and publication*	*No.*
1924.1196	110* × 110* × 28	NB	Kish	School tablet, type 1b: obverse S^b A; reverse metrological list (weights)	39
1924.1214	50* × 56* × 31*	OB	Kish	School tablet, type I?: table of squares	17
1924.1217	56* × 91* × 30	NB	Kish	School tablet, type 1b: obverse S^b A; reverse S^b A, metrological list (capacities), spellings. Copy: *OECT* 4: 34	31
1924.1242	78* × 80* × 29	NB	Kish	School tablet, type 1b: obverse S^a; reverse spellings, metrological list (weights). Copy: *OECT* 4: 123 (obverse)	40
1924.1278	41 × 36 × 18	NB	Kish	Square tablet: metrol-ogical list (capacities), with colophon	29
1924.1341	38* × 48* × 18*	OB	Kish, Ingharra C-7	School tablet, type III: metrological table (weights). Copy: *OECT* 15: 157	26
1924.1450	65* × 61* × 28	NB	Kish	School tablet, type 1b: obverse Hh I; reverse contract, metrological list (lengths), spellings	35
1924.1464+2006 +2068	82* × 52* × 33	NB	Kish	School tablet, type 1b: obverse Hh III; reverse metrological list (lengths). Copies: *MSL* SS1: 9; *OECT* 11: 140 (obverse)	36
1924.1477	68* × 55* × 30	NB	Kish	School tablet, type 1b: obverse S^a; reverse list of PNs, metrological list (capacities)	32
1924.1520+1529	85* × 33* × 24	NB	Kish	School tablet, type 1a: obverse S^a; reverse S^a, metrological list (capacities). Copy: *OECT* 4: 128	33
1924.1760	68* × 55* × 25*	NB	Kish	School tablet, type 1b: obverse missing; reverse Hh XVIII, spellings, metrological list (lengths). Copy: *OECT* 11: 139	37

Museum number	*Measurements*	*Period*	*Provenance*	*Description and publication*	*No.*
1924.1847	75* × 52* × 31	NB	Kish	School tablet, type Ib: obverse Hh II; reverse metrological list (lengths). Copy: *MSL* SS1: 62 (obverse)	38
1924.2214	30* × 28* × 21	NB	Kish	School tablet, type 1: obverse S[a]; reverse metrological list (weights)	41
1926. 634	47 × 40 × 18	JN	Jemdet Nasr	Numerical tablet. Copy and edition: *MSVO* 1: 237	—
1929.833	104* × 65 × 38	OB	Kish	School tablet, type III: multiplication tables × 2 24 and 2; colophon	16
1930.365	58* × 60* × 38	OB	Kish	Two tablets squashed together in recycling: Sumerian and tabular calculations. Copy: *OECT*15: 170	18
1931.91	d. 82 × 32	OB	Kish, Ingharra C-10, 1m (2)	School tablet, type IV: geometrical diagram of triangle	24
1931.137	210 × 158 × 40	OB	Kish	School tablet, type I: metrological list of capacities, weights, and areas	19
1932.180	72* × 46 × 19	OB	Kish, Ingharra C-11	School tablet, type III: multiplication table × 12;30	25
1932.187h	67* × 35* × 28	NB	Kish, Ingharra C-11	School tablet, type 1a or 1b: obverse S[b] A; reverse metrological list (capacities)	27
1932.526n	58* × 58* × 27	OB	—	School tablet, type II: obverse Ur_5-ra 1; reverse metrological list (capacities). Copy: *MSL* SS1: 95	12
1933.180	66* × 78* × 38	OB	—	School tablet, type I or II: metrological list (capacities). Copy: *OECT* 13: 221	13
Bodleian AB 216	77 × 49 × 24	OB	—	Mathematical problem with worked solution and diagram	14

Tablets edited elsewhere

Three tablets in the catalogue have not been edited here because they are already fully published elsewhere. Ashmolean 1926.634, from Jemdet Nasr (*MSVO* 1: 237), is a so-

called 'numerical' tablet. Dating from the very dawn of writing, it contains numerical symbols — eight identical circular impressions — alone. Ashmolean 1924.689 (*MAD* 5: 112) is one of just a dozen or so mathematical problem texts known from the Old Akkadian period. It assigns two problems on finding the areas of squares to one Ur-Ištaran, whose name also appears on the contemporary mathematical tablet A 5446 (Whiting 1984). On the reverse is an answer which does not appear to fit either problem set. The tablet was studied by Powell (1976: 428–9) and Whiting (1984: 66); the Old Akkadian mathematical corpus in general has been surveyed most recently by Foster and Robson (2004). Finally, Ashmolean 1921.1154 (Izre'el 1997: EA 368) is a unique fragment of a cuneiform Egyptian-Akkadian vocabulary, found in a private house in Amarna (ancient Akhetaten) in Egypt. The surviving fragment lists Egyptian weight names and presumably also originally gave their equivalents in Akkadian.

Comparanda

BM 96949 is published here, in the discussion of **Tablet 19**, courtesy of Christopher Walker and the Trustees of the British Museum. YBC 11924 is published, with **Tablets 2–3**, courtesy of Ben Foster and Ulla Kasten of the Yale Babylonian Collection.

Note on transliterations and translations

Standard OB lists and tables are transliterated but not translated. Modern equivalents of metrological units are given in the text where necessary. It is indicated whether the numerals 7 and 8 are written in 'mathematical' format with three registers of wedges or 'non-mathematically' with two. In the past some scholars have used these formats as dating criteria, with 'non-mathematical' formats supposedly indicating slightly older tablets. While it is certainly true that the 'mathematical' numerical format was an OB innovation, the two can appear side by side on the same tablet, as for instance on Plimpton 322 (*MCT*: text A) where their mathematical and non-mathematical functions are clearly demarcated (Robson 2001*a*: 173). In elementary scribal exercises such as multiplication tables, however, it may be that the use of the 'non-mathematical' format should be considered erroneous. Similarly, within the OB school corpus the use of the ligature 20-lá-1 for 19 is much more commonly written on 'first exposure' tablets (namely Types II/1 and III) than on 'revision' tablets (e.g. *MCT*: 20-33); any chronological significance has yet to be proved. The issue has been discussed most recently by Oelsner (2001).

Sumerian words within standard Old Babylonian lists and tables are set in normal type, as it is assumed that Sumerian was the target language of instruction. Within the Akkadian-language problem (26) and the Neo-Babylonian tables and exercises (27–41) Sumerograms are written in SMALL CAPS and syllabic Akkadian (the target language) in *italics*. Throughout the article words missing from the original tablets are restored within square brackets, [thus], or where not restorable as […]. Uncertain translations are marked with a question mark: (?). Accidental omissions are restored ‹within angle brackets›, accidental inclusions «within double angle brackets». Occasional editorial comments are shown in round brackets, (thus). Sexagesimal number notation follows Friberg (1987–90: 534): space is left between sexagesimal places, and the 'sexagesimal point' is marked throughout by a semicolon, but often its placing is conjectural.

Old Babylonian tablets from Larsa and elsewhere

Tablet typology and Old Babylonian schooling

Building on work by Veldhuis (1997) and Tinney (1999), I have elsewhere described in detail the role of metrology and arithmetic within the scribal curriculum of a single school, so-called House F, from eighteenth-century Nippur in which such tablets comprised 10 percent of the whole assemblage (Robson 2002). I summarise the findings here, insofar as they are relevant to understanding the tablets published here. In this context 'school house' simply means a domestic dwelling in which one or more students were taught, according to the evidence of large numbers of school tablets as well as the presence of tablet recycling bins (cf. Faivre 1995).

As Neugebauer showed many years ago, Old Babylonian multiplication tables were recorded in a standard order, with minor variations in content and format (*MKT*: I 36–42, II 36, III 49–50; *MCT*: 19–33). The series begins with a table of segaxesimally regular reciprocal pairs and then runs in descending order from the 50 times table to the 1;15 times table (see Table 1). Each multiplication table has entries for multiplicands 1–20, 30, 40, and 50, and occasionally ends by listing some combination of the square, square root, and reciprocal of the multiplier. It is also clear from Neugebauer's catalogues that some tablets end with a colophon giving information about the scribe and circumstances of composition, while others also bear other school exercises.

Table 1: The standard Old Babylonian series of multiplication tables

Reciprocals							
50	36	20	12;30	8	6	3;20	2
48	30	18	12	7;30	5	3	1;40
45	25	16;40	10	7;12	4;30	2;30	1;30
44 26 40	24	16	9	7	4	2;24	1;20
40	22 30	15	8;20	6;40	3;45	2;15	1;15

Neugebauer distinguished between 'single' multiplication tables — tablets with only one multiplication table on them — and 'combined' multiplication tables — tablets with two or more tables from the standard sequence. This categorisation can be fruitfully compared to Civil's typology of elementary exercise tablets from Old Babylonian Nippur (*MSL* 14: 5–7; Civil 1995: 2308), which he drew up in order to describe lexical lists but which Veldhuis (1997) has showed is applicable to other elementary scribal exercises too (see Table 2). It is immediately apparent that 'single' multiplication tables were written on tablet Types II/1, III, and rarely IV, while 'combined' tables were written on Types I, II/2 and P. It also becomes clear that Neugebauer's multiplication tables on the same tablets as other compositions (e.g. *MCT*: nos. 145, 149, 167) are all Type II tablets, exclusively from Nippur, while those with colophons tend to be Type III tablets from places other than Nippur. It is possible to show that the Nippur schools used tablet Types II/1 III, and IV to teach students an exercise for the first time, by copying from a teacher's model (Type II/1) and then by writing out from memory (Type III). The reverse of Type II tablets were used to revise long sequences of exercises memorised earlier (Type II/2), as were Types I and P, which may have served to mark the end of the learning process. It appears that although the Nippur students went through the whole of the standard multiplication series at least once, revision was focussed much more heavily

on the beginning of the sequence than the end (Robson 2002). Much less is known about scribal schooling in other cities and we must be careful about generalising from the Nippur evidence.

Table 2: Civil's typology of elementary school tablets from Old Babylonian Nippur, compared to Neugebauer's categorisation of multiplication tables

Tablet type	*Description*	*Neugebauer's terminology*
I	Large multi-columned tablets with 2–6 or more columns on each side, containing a whole composition of several hundred lines, or a third or a half of the composition, in small script	Combined
II	Large teacher-student copies, whose obverse (conventionally denoted II/1) contains 2–3 columns of about 10-30 lines in large, calligraphic script, with the same text in each column. The left-hand column is more competently written than the right-hand one(s), in which there are frequently erasures. The reverse (II/2) contains a long extract of another composition, or an earlier section of the same one, in 3–6 or more columns of smaller, cursive script	Obverse (II/1): single; reverse (II/2): combined
III	Small one-columned tablets (Sumerian im-gíd-da), with a 10–30 line extract of a composition, and sometimes the first line of the next section or composition in the series	Single
IV	Round tablets ('buns' or 'lentils') with two to four lines of a composition, in various combinations of the teacher's and student's copies on the obverse and reverse.	(Single)
P	Four- or six-sided prisms, typically with one two columns per face and a hollow central axis, with similar contents to Type I tablets	Combined

Neugebauer identified three types of textual format with four rarely occurring sub-formats (*MCT*: 20). So-called Type A has entries of the form (*n*) a-rá *m nm* '(*n*) times *m* is *nm*'; while so-called Types B and C have entries of the form (*n*) *m nm*, except that the first entry of Type B is of the verbose format *n* a-rá 1 *n* '*n* times 1 is *n*'. Format Type A one can characterise as 'verbose'; format Types B and C as 'terse'. It turns out that verbose formats are heavily correlated with initial learning on tablet Types II/1 and III, while terse formats are closely associated with revision on tablet Types I, II/2 and P (Table 3; see Robson 2002).

Table 3: Correlation of tablet types and format types in the standard Old Babylonian series of multiplications

Tablet Type	*I and II/2*	*('combined' tables)*	*II/1 and III*	*('single' tables)*
Format Type	*Terse*	*Verbose*	*Terse*	*Verbose*
Neugebauer[4]	80–90%	10–20%	20–30%	70–80%
House F	89%	11%	15%	85%

[4] Neugebauer (1935–37: I 62–64) already highlighted the strong correlation between tablet type and textual format: the percentages given here are deliberately approximate, as they depend on how one defines and counts the tables. It was impossible to do this accurately without inspecting all of those listed in *MKT* and *MCT* for myself.

Veldhuis (1997) has correlated obverses and reverses of Type II tablets from Nippur to establish a curricular sequence in which the standard series of multiplications was learned about three quarters of the way through elementary education, after Sumerian vocabulary had been mastered. In this phase the students also learned metrology and the 'advanced' lexical lists which demonstrate how the cuneiform writing system worked. They then went on to write connected Sumerian prose and poetry.

While the metrological systems themselves are very well known, the elementary school tablets onto which scribal students copied them have barely been published or studied at all.[5] For now, it can be said that in Nippur the same tablet types were used, presumably for the same educational purposes, and that the standard metrological sequence ran as follows:

Capacity:	1/3 silà – 1 00 00 gur	(5 60^4 silà)	c.0.3 – 65 million litres
Weight	1/2 še – 1 00 gun	(3 60^4 še)	c.0.05 g – 1,800 kg
Area:	1/3 sar – 2 00 00 bùr	(60^4 sar)	c.12 m^2 – 47,000 ha
Length:	1 šu-si – 1 00 dana	(3 60^4 šu-si)	c.17 mm – 650 km (after Friberg 1990: 543).

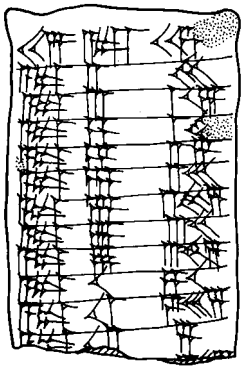
Extracts from the series could be written in the form of lists — with each entry containing the standard notation for the measures only — or as tables — where the standard writings were supplemented with their sexagesimal equivalents; but it is not yet clear whether these two formats were the didactic equivalent of the 'terse' and 'verbose' multiplication formats. Some Type I and Type P metrological series end with tables of squares, inverse squares, and inverse cubes.

Finally, calculations and arithmetical practice belong to a later stage of the scribal curriculum according to current evidence. In a school-house from the eighteenth-century city of Ur, so-called No. 1 Broad Street, calculations are found on the reverse of Type IV tablets whose obverses contain Sumerian proverbs (Robson 1999; 2002; Friberg 2000). One tablet from House F bears a 20-line extract of a Sumerian literary composition as well as a calculation (Robson 2002). Otherwise Nippur calculations are typically on square tablets. There is not yet any firm archaeological evidence to place so-called mathematical problem texts — that is tablets which set one or more mathematical problems and may provide answers and/or model solutions too — within the domain of the school-house at Nippur. The evidence from '7, Quiet Street' and '1, Broad Street' in Ur (Brusasco 1999–2000: 116–118, 124–126, 152–154, 159–161; Friberg 2000) and from the 'Scholar's library at Me-Turān, modern Tell Haddad (Cavigneaux 1999), is more suggestive. Nevertheless, the calculations and diagrams on Type IV and square tablets were clearly written in response to mathematical problems such as those found on 'problem text' tablets.

[5] Christine Proust has recently re-evaluated the few Nippur metrological tablets published by Hilprecht (1906) and together we will publish the remainder from Nippur.

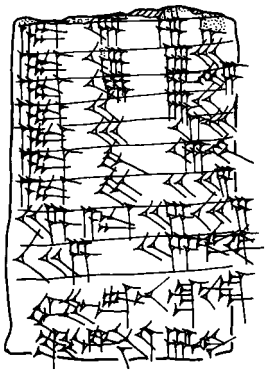
1. Ashmolean 1922.178

Type III tablet with lower edge missing: multiplication table × 25 in verbose format, ending with square and inverse square (íb-si$_8$) and with colophon giving the name of the scribe — one Bēl num[6] — and the month and day of composition. Numerals mostly in 'non-mathematical' format; ruled.



Obverse

1.	25 a-rá 1	25
	a-rá 2	50
	a-rá 3	1 15
	a-rá 4	1 40!
5.	a-rá 5	2 05
	a-rá 6	2 30
	a-rá 7	2 55
	a-rá 8	3 20
	a-rá 9	3 45
10.	a-rá 10	4 10
	a-rá 11	4 35
	a-rá 12	5
	[a-rá 13]	⌜5 25⌝
	[a-rá 14	5 50]



Reverse

1.	[a-rá 15	6 15]
	[a-rá 16]	⌜6⌝ [40]
	a-rá 17	7 05
	a-rá 18	7 30
5.	a-rá 19	7 55
	a-rá 20	8 20
	a-rá 30	12 30
	a-rá 40	16 40
	a-rá 50	20 25 (*sic*)
10.	25 a-rá 25	10 25
	10 25	25 íb-si$_8$

im-gíd-da *be-la-nu-um*	Long tablet of Bēlānum
iti še-kin-kud ud-7-kam	Month XII, day 7

2.–3. Ashmolean 1924.447 and Ashmolean 1924.451

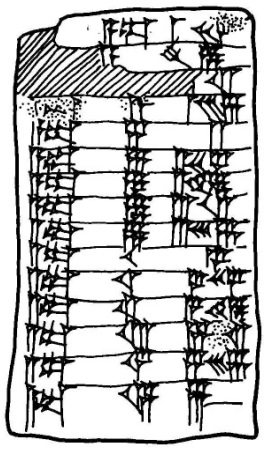
Complete Type III tablets: multiplication tables × 24, bearing colophons by the same trainee scribe, one Suen-apil-Urim. One is dated to the 9th day of Month XII (February–March), the other to the 13th day. A further tablet at Yale, YBC 11924 (*MCT*: 23, no. 99,13b), is a multiplication table × 4 by the same scribe dating to the 11th day of Month VI (August–September) in the 8th regnal year of Rim-Sin of Larsa, or 1815 BCE (copy below). Because the standard series of multiplication tables runs in descending order, from largest to smallest head numbers, the Ashmolean tablets must

[6] Given the tablet's striking physical resemblance to YBC 11924 below, dated to 1815 BCE, the scribe is unlikely to be identical to the Bēlānum who later took the name Ur-Utu, who was a home-schooled scribal student in Sippir Amnānum in the 1640s BCE (Tanret 2002: 155).

predate the Yale specimen. Thus it took this scribe six months to progress from the 24 × table (tenth in the series) to the 4 × table (thirtieth) — and presumably about year to cover the whole series from beginning to end. This is our first concrete evidence for the duration of any part of the Old Babylonian scribal curriculum. It is impossible to know yet whether this result is generalisable or an idiosyncratic case.

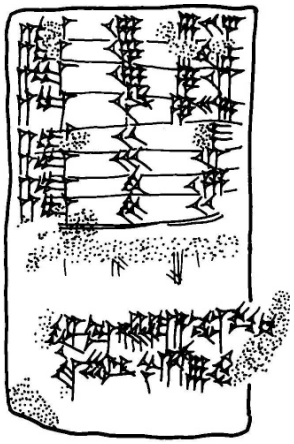
Tablet 5, a Type III multiplication table for 10 with a damaged colophon, may also be by the same scribe.

Ashmolean 1924.447



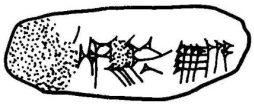
Obverse

1.	[24] a-rá 1	2⌜4⌝
	[a-rá] 2	48
	[a-rá 3]	1 12
	⌜a-rá 4⌝	1 36
5.	a-rá 5	2
	a-rá 6	2 24
	a-rá 7	2 48
	a-rá 8	3 12
	a-rá 9	3 36
10.	a-rá 10	4
	a-rá 11	4 24
	a-rá 12	4 48
	a-rá 13	5 12
	a-rá 14	5 36
15.	a-rá 15	6



Reverse

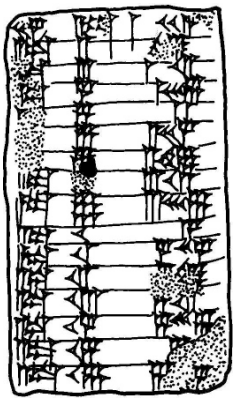
1.	a-⌜rá⌝ 16	6 24
	a-⌜rá⌝ 17	⌜6 48⌝
	a-rá 18	7 12
	a-rá 20-lá-1⌝	7 36
5.	a-⌜rá⌝ 20	⌜8⌝
	a-rá 30	12
	a-rá 40	16
	a-rá 50	20
	==========	
	(*erasures*)	
10.	im-‹gíd›-da ^{d}suen-a-píl-urím$^{[ki]}$	‹Long› tablet of Suen-apil-Urim
	iti še-kin-kud-a ud-9-kam	Month XII, day 9



Upper edge

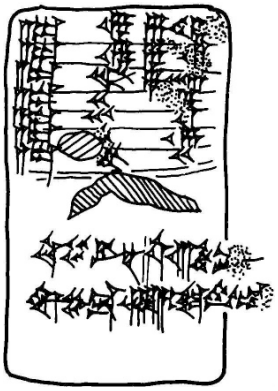
1.	[zà]-⌜mí⌝ ^{d}nisaba ‹^{d}›é-a	Praise Nisaba (and) Ea!

Ashmolean 1924.451



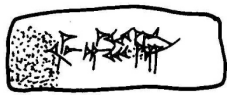
Obverse

1.	24 a-rá 1	24
	a-rá 2	⌜48⌝
	⌜a-rá⌝ 3	1 12
	⌜a-rá⌝ 4	1 36
5.	[a-rá] 5	2
	[a-rá] 6	2 24
	[a-rá] 7	2 48
	⌜a⌝-rá [8]	3 12
	a-rá 9	3 36
10.	a-rá 10	4
	a-rá 11	4 24
	a-rá 12	⌜4 48⌝
	a-rá 13	⌜5⌝ 12
	a-rá 14	5 36
15.	a-rá 15	⌜6⌝
	a-rá 16	6 [2]4



Reverse

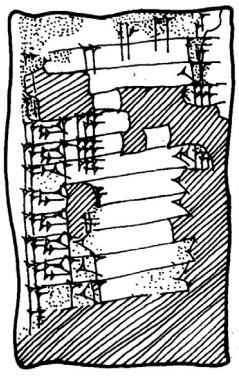
1.	a-rá 17	6 4⌜8⌝	
	a-rá 18	7 12	
	a-rá 20-lá-1	7 3⌜6⌝	
	a-rá 20	⌜8⌝	
5.	a-rá 30	⌜12⌝	
	a-rá ⌜40⌝	16	
	a-rá 50	20	
	==========		
	iti še-kin-kud	ud-13-kam ba-zal	Month XII, completed day 13
	im-gíd-da	^{d}suen-a$^{!}$-píl-urím$^{[ki]}$	Long tablet of Suen-apil-Urim



Upper edge

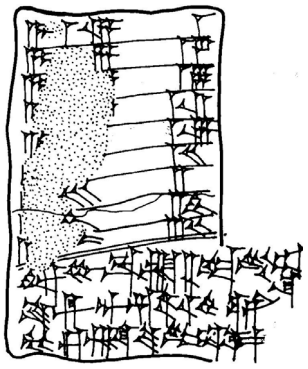
1.	[zà]-mí$^{!}$ ^{d}nisaba	Praise Nisaba!

YBC 11924



Obverse

1.	[4] ⌜a-rá⌝ 1	⌜4⌝
	⌜a-rá⌝ 2	⌜8⌝
	[a-rá 3]	12
	⌜a⌝-[rá 4]	16
5.	a-rá 5	[20]
	a-rá 6	[24]
	a-⌜rá 7⌝	28
	a-rá ⌜8⌝	⌜3⌝[2]
	a-rá ⌜9⌝	⌜3⌝[6]
10.	a-rá 10	[40]
	a-rá 11	[44]
	a-⌜rá⌝ 12	[48]
	a-[rá 13	52]
	[a-rá 14	56]

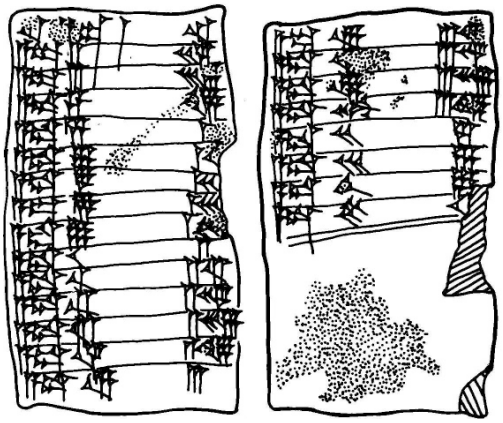


Reverse

1.	a-⌜rá⌝ 15	1	
	a-⌜rá 1⌝6	1 04	
	a-⌜rá⌝ [1]⌜7⌝	1 08	
	a-[rá 1]⌜8⌝	1 12	
5.	a-⌜rá⌝ [20-lá-1]	1 16	
	[a-rá 20]	1 20	
	[a-rá] 30	2	
	[a-rá] 40	2 40	
	a-[rá] ⌜50⌝	3 20	
	==========		
10.	im-gíd-da ^{d}suen-a-píl-urím^{ki}		Long tablet of Suen-apil-Urim
	iti kin-^{d}inana ud-11-kam ba-zal		Month VI, completed day 11
	mu é-^{d}en-ki šà urim^{ki}-ma		Year of Enki's temple in Urim.

4. Ashmolean 1924.450

Complete Type III tablet: multiplication table × 12, in 'verbose' format; ruled.



Obverse

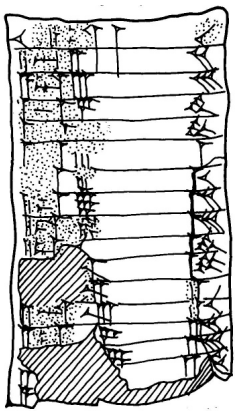
1.	⌜12 a⌝-rá 1	12
	a-rá 2	24
	a-rá 3	36
	a-rá 4	48
5.	a-rá 5	1
	a-rá 6	1 1[2]
	a-rá 7	1 2[4]
	a-rá 8	1 3[6]
	a-rá 9	1 4[8]
10.	a-rá 10	2
	a-rá 11	2 12
	a-rá 12	2 24
	a-rá 13	2 36
	a-rá 14	2 48
15.	a-rá 15	3

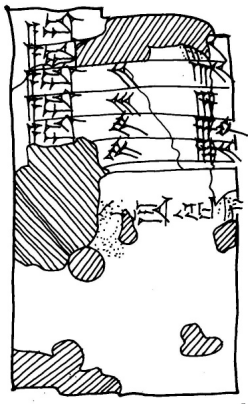
Reverse

1.	a-rá 16	3 12
	a-rá ⌜17⌝	3 24
	a-rá 18	3 36
	a-rá 20-lá-1	3 48
5.	a-rá 20	4
	a-rá 30	6
	a-rá 40	8
	a-rá 50	10
	==========	

5. Ashmolean 1924.472

Complete Type III tablet, with some damage to the obverse. Multiplication table × 10 in 'verbose' format, with colophon giving scribe's name (which may possibly be Suen-apil-Urim, as on **Tablets 2–3**). Numerals in 'mathematical' format; ruled.





Obverse

1.	10 ⌜a-rá⌝ 1	10
	⌜a-rá⌝ 2	20
	a-⌜rá⌝ 3	30
	⌜a-rá⌝ 4	40
5.	⌜a-rá⌝ [5]	50
	⌜a-rá 6⌝	1
	[a]-⌜rá 7⌝	1 10
	⌜a-rá⌝ 8	1 20
	⌜a-rá 9⌝	1 30
10.	⌜a-rá⌝ 10	1 40
	[a-rá] 11	1 50
	[a-rá] 12	⌜2⌝
	⌜a-rá⌝ 13	⌜2⌝ 10
	⌜a-rá 1⌝4	2 20
15.	[a-rá 1]5	2 30
	⌜a⌝-[rá 16]	2 ⌜40⌝
	⌜a⌝-[rá 17	2 50]

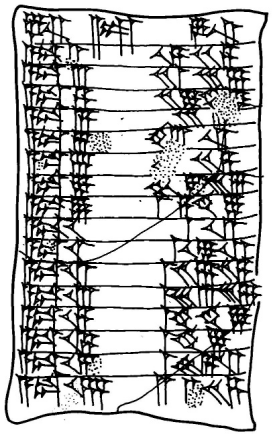
Reverse

1.	a-rá [18	3]
	a-rá [19]	⌜3⌝ 10
	a-rá 20	3 20
	a-rá 30	5
5.	a-rá 40	6 40
	[a-rá] 50	8 20
	==========	
	[im]-⌜gíd⌝-da ⌜^{d}suen-a⌝-[píl-urím^{ki} ??]	

(‘Long tablet of Suen-[apil-Urim]?’)

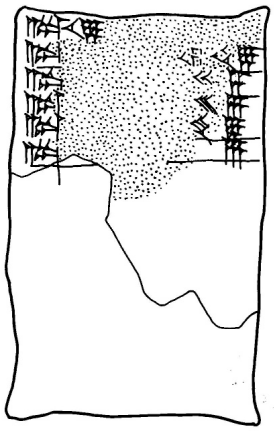
7. Ashmolean 1924.457

Complete type III tablet with some surface erosion on the reverse. Multiplication table × 7;12 in ‘verbose’ format. Numerals in ‘non-mathematical’ format; ruled.



Obverse

1.	7 12 a-rá 1	7 12
	a-rá 2	14 24
	a-rá 3	21 36
	a-rá 4	28 ⌜48⌝
5.	a-rá 5	3[6]
	a-rá 6	43 12
	a-rá 7	[50] 24
	a-rá 8	⌜57⌝ 36
	a-rá 9	1 04 48
10.	a-rá 10	1 12
	a-rá 11	1 19! 12
	a-rá 12	1 26 24
	a-rá 13	1 33 36
	a-rá 14	1 40 48
15.	a-rá 15	1 48
	a-rá 16	1 55 12
	a-rá 17	2 02 24

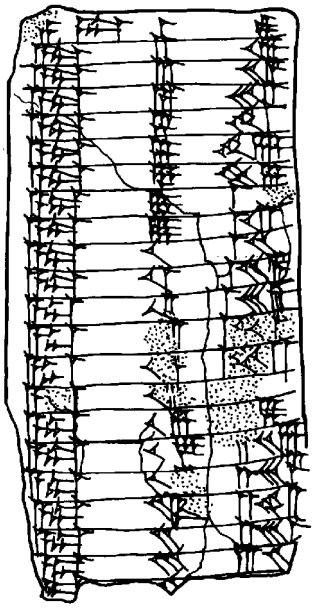


Reverse

1.	a-rá 18	[2 09 36]
	a-rá [19	2] ⌜16⌝ 48
	a-rá [20	2] 24
	a-rá [30	3] 36
5.	a-rá [40	4] 48
	a-rá [50]	6

6. Ashmolean 1923.318

Type III tablet with lower edge missing; reverse blank. Multiplication table 8 in 'verbose' format. Numerals in 'mathematical' format, but 19 written as '20-lá-1'; ruled. The errors towards the end of the table are of three types: the first three are all too large by 10, while the fourth has been found by adding 7 instead of 8 to the previous result. Finally, the scribe gives the product of 6;40 and 30.

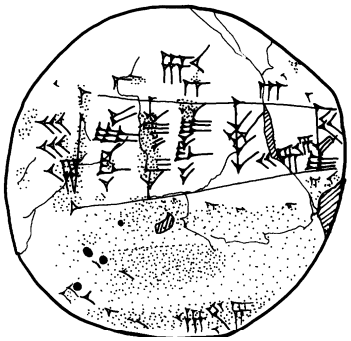


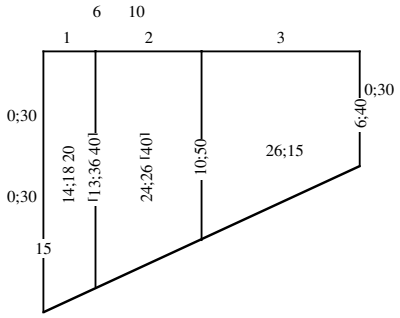
Obverse

1.	⌜8⌝ a-rá 1	8
	a-rá 2	16
	a-rá 3	24
	a-rá 4	32
5.	a-rá 5	4«1»
	a-rá 6	48
	a-rá 7	56
	a-rá 8	1 [04]
	a-rá 9	1 12
10.	a-rá 10	1 20
	a-rá 11	1 28
	a-rá 12	1 36
	a-rá ⌜13⌝	1 ⌜44⌝
	a-rá ⌜14⌝	1 ⌜5⌝2
15.	a-rá ⌜15⌝	[2]
	a-rá 16	[2] 08
	a-rá 17	2 26 (*sic*; for 2 16)
	a-rá ⌜18⌝	2 34 (*sic*; for 2 24)
	a-rá 20-lá-1	2 42 (*sic*; for 2 32)
20.	a-rá 20	2 35 (*sic*; for 2 40)
	a-rá 30	3 20 (*sic*; for 4)
	⌜a-rá 40⌝	[…]
	[…]	

8. Ashmolean 1922.168

Complete Type IV tablet. Obverse contains numbered geometrical diagram of a trapezium; reverse covered in tiny semi-erased numerals.

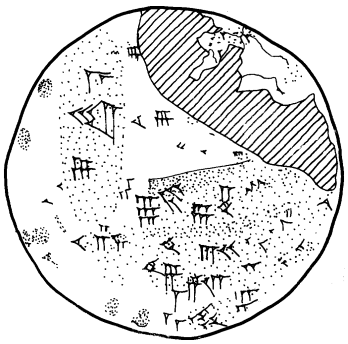




The length, 6, and its reciprocal, 10, are at the top centre of the diagram. That length is divided into three unequal parts in an arithmetic progression: 1, 2, 3, written immediately underneath. The areas and widths of the resulting sub-strips are given between and along the vertical lines. The upper width (according to Old Babylonian convention) on the outer left edge, 15, and the area of the right-most strip, 26 15, are orientated in the same direction as the length measurements; the others are all aligned to the vertical lines. The three 30s to the left and right of the diagram are multiplication coefficients:

$$\text{Area} = \text{length} \times 0;30(\text{width}_1 + \text{width}_2)$$

$$14;18\ 20 = 1 \times 0;30(15 + 13;36\ 40)$$
$$24;26\ 40 = 2 \times 0;30(13;36\ 40 + 10;50)$$
$$26;15 = 3 \times 0;30(10;50 + 6;40)$$

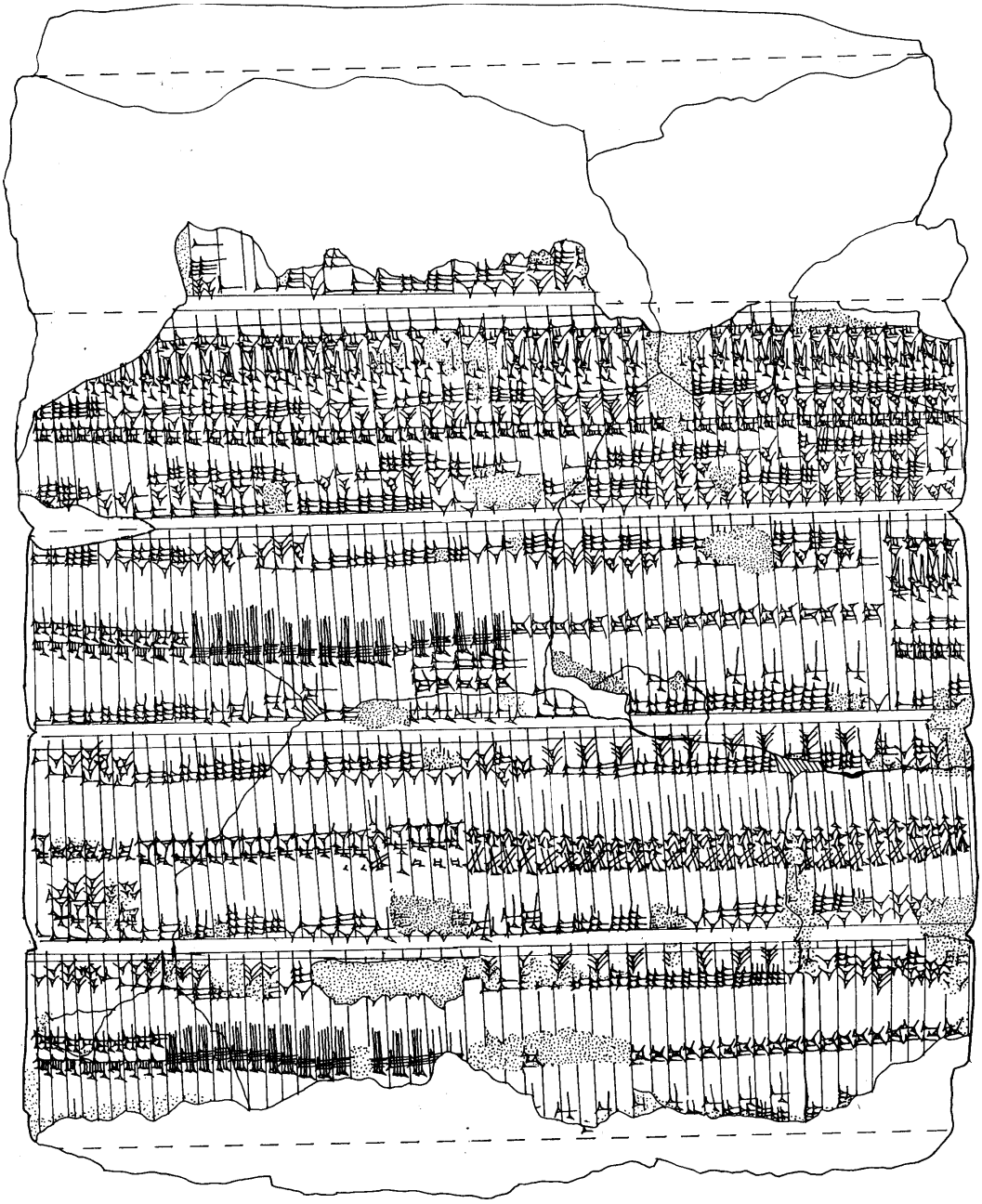


The total area, 1 05, is not mentioned. It is not clear which parameters were given and which the student had to calculate. The numerals visible through the erasures on the lower half of the tablet may have been written in the course of the calculations.

There are many scattered numbers covering the reverse, which may or may not relate to the diagram of the trapezium on the obverse (Robson 1999: 273–4).

9. Ashmolean 1923.366

Solid six-sided prism (Type P) with a hole running along the vertical axis; one side completely destroyed. Metrological table of horizontal lengths with respect to rods (sides a–b) and vertical heights with respect to cubits (side c); table of inverse squares (íb-si$_8$, sides c–e); table of inverse cubes (ba-si$_8$, sides e–[f]). Very similar in size and shape to AO 8865, a six-sided prism from Larsa, which bears tables of squares, inverse squares, and inverse cubes and has a colophon dating it to 1749 BCE (*MKT*: I 69, 71–72, 89–90). As lengths are the last section of the metrological series, presumably there was originally a companion prism with the tables for capacities, weights and areas occupying two each of its six sides.



Sides a–e from bottom to top

Length measures: 1 dana (‘double-hour’) = 30 UŠ = 1800 ninda (‘rod’) = *c*.11 km
1 ninda = 12 kùš (‘cubit’) = 360 šu-si (‘finger’) = *c*.6 m

Side a			*Side b*			*Side c*	
1.	[1] šu-si	10	1.	1 UŠ	1	1. 1 šu-si	2
	[2] šu-si	20		1 UŠ 10 ninda	1 10	2 su-si	4
	[3] šu-si	30		1 UŠ 20 ninda	1 20	3 šu-si	6
	[4] šu-si	40		1 UŠ 30 ninda	1 30	4 šu-si	8

5.	[5] šu-si	50
	[6] šu-si	1
	[7] šu-si	1 10
	[8] šu-si	1 20
	[9] šu-si	1 30
10.	[1/3] kùš	1 ⌜40⌝
	[1/2] kùš	2 30
	[2/3] kùš	3 20
	[1] kùš	5
	[1 1/3] kùš	⌜6⌝ [40]
15.	[1 1/2] kùš	[7] 30
	[1 2/3] kùš	⌜8⌝ 20
	[2] kùš	10
	[3] kùš	15
	[4] kùš	[20]
20.	[5] kùš	[25]
	[1/2 ninda]	30]
	[1/2 ninda 1] kùš	[35]
	[1/2 ninda 2] kùš	[40]
	[1/2 ninda 3] kùš	[45]
25.	[1/2 ninda 4] kùš	[50]
	[1/2 ninda 5] kùš	[55]
	[1 ninda]	1
	[1 1/2 ninda]	1 30
	[2 ninda]	2
30.	[2] 1/2 ninda	⌜2 30⌝
	[3 ninda]	⌜3⌝
	[3] 1/2 [ninda]	⌜3 30⌝
	[4 ninda]	4
	[4] 1/2 [ninda]	4 30
35.	[5 ninda]	5
	[5] 1/2 ninda	5 30
	[6] ninda	6
	[6] 1/2 ninda	6 ⌜30⌝
	⌜7⌝ ninda	7
40.	⌜7⌝ 1/2 ninda	7 30
	⌜8⌝ ninda	8
	⌜8⌝ 1/2 ninda	8 30
	⌜9⌝ ninda	9
	⌜9⌝ 1/2 ninda	9 30
45.	[10] ninda	10
	⌜15⌝ ninda	⌜15⌝
	[20] ninda	20
	⌜25⌝ ninda	25
	[30] ninda	30
50.	[35] ninda	35
	[40] ninda	40
	[45] ninda	45
	[50] ninda	50
	[55] ⌜ninda	55⌝

5.	1 ⌜UŠ 40⌝ ninda	1 40
	1 ⌜UŠ 50⌝ ninda	1 50
	2 UŠ	2
	3 UŠ	3
	⌜4⌝ UŠ	4
10.	5 UŠ	5
	⌜6⌝ UŠ	6
	7 UŠ	7
	8 UŠ	8
	9 UŠ	9
15.	10 UŠ	10
	11 UŠ	11
	UŠ	12
	13 UŠ	13
	14 UŠ	14
20.	1/2 dana	15
	⌜16⌝ UŠ	16
	⌜17⌝ UŠ	17
	⌜18⌝ UŠ	⌜18⌝
	⌜19⌝ UŠ	⌜19⌝
25.	2/3 dana	20
	1 dana	30
	1 1/2 dana	45
	1 2/3 dana	50
	2 dana	1
30.	3 dana	1 30
	4 dana	2
	5 dana	2 30
	6 dana	3
	7 dana	3 30
35.	⌜8⌝ dana	4
	⌜9⌝ dana	4 30
	10 dana	5
	11 dana	5 30
	12 dana	6
40.	13 dana	6 30
	14 dana	7
	⌜15⌝ dana	7 30
	[16] dana	⌜8⌝
	17 dana	⌜8⌝ 30
45.	18 dana	9
	⌜19⌝ dana	9 30
	20 dana	10
	30 dana	15
	40 dana	20
50.	⌜50⌝ dana	25
	[1] dana	30
	[…] dana	[…]

5.	5 šu-si	10
	6 šu-si	12
	7 šu-si	14
	8 šu-si	16
	9 šu-si	18
10.	1/3 kùš	20
	1/2 kùš	30
	2/3 kùš	40
	1 kùš	1
	1 1/3 kùš	1 20
15.	1 1/2 kùš	1 30
	[1] 2/3 kùš	1 40
	2 kùš	2
	3 kùš	3
	[4] kùš	4
20.	[5] kùš	5
	⌜1/2⌝ ninda	6
	1/2 ninda 1 kùš	7
	1/2 ninda 2 kùš	8
	1/2 ninda 3 kùš	9
25.	1/2 ninda 4 kùš	10
	1/2 ninda 5 kùš	11
	1 ninda	12
	1 1/2 ninda	18
	2 ninda	24
30.	2 [1/2] ninda	30
	[3] ninda	36
	[3] ⌜1/2⌝ ninda	42
	4 ninda	48
	4 1/2 ninda	54
35.	5 ninda	1
	5 1/2 ninda	1 06
	6 ninda	1 ⌜12⌝
	6 1/2 ninda	1 [18]
	7 ninda	[1 24]
40.	7 1/2 ninda	[1 30]
	8 ninda	1 36
	8 1/2 ninda	1 42
	⌜9⌝ ninda	1 48
	[9] 1/2 ninda	1 54
45.	10 ninda	2
	==========	
	1-e 1 íb-si$_8$	
	4-e 2 íb-si$_8$	
	[9]-e 3 íb-si$_8$	
	16-e 4 íb-si$_8$	

Side d

1. [25-e 5 íb-si$_8$]
[3]6-e 6 [íb-si$_8$]
[4]9-e 7 [íb-si$_8$]
[1] 04-e 8 ⌜íb⌝-[si$_8$]
5. [1] 21-e 9 ⌜íb⌝-[si$_8$]
[1] 40-e 10 íb-[si$_8$]
2 01-e 11 íb-[si$_8$]
2 24-e 12 íb-⌜si$_8$⌝
2 49-e 13 íb-si$_8$
10. 3 16-e 14 íb-si$_8$
3 45-e 15 íb-si$_8$
4 16-e 16 íb-si$_8$
⌜4 4⌝9-e 17 íb-si$_8$
⌜5 24⌝-e 18 íb-si$_8$
15. 6 01-e 19 íb-si$_8$
6 40-e 20 íb-si$_8$
7 21-e 21 íb-si$_8$
8 04-e 22 íb-si$_8$
8 49-e 23 íb-si$_8$
20. 9 36-e 24 íb-si$_8$
10 25-e 25 íb-si$_8$
11 16-e 26 ⌜íb-si$_8$⌝
⌜12 09⌝-e ⌜27 íb-si$_8$⌝
[13] 04-e 28 ⌜íb⌝-si$_8$
25. 1[4] 01-e 29 íb-si$_8$
15-e 30 íb-si$_8$
16 01-e 31 íb-si$_8$
17 04-e 32 íb-si$_8$
18 09-e 33 íb-si$_8$
30. 19 16-e 34 íb-si$_8$
20 25-e [35 íb-si$_8$]
21 36-⌜e⌝ [36 íb-si$_8$]
22 49-e 37 ⌜íb-si$_8$⌝
2[4] 04-e 38 íb-si$_8$
35. 25 21-e 39 íb-si$_8$
26 40-e 40 íb-si$_8$
28 01-e 41 íb-si$_8$
29 24-e 42 íb-si$_8$
30 49-e 43 íb-si$_8$
40. 32 16-e 44 íb-si$_8$
33 45-e 45 íb-si$_8$
35 16-e 46 íb-si$_8$
36 49-e 47 íb-si$_8$
38 24-e 48 íb-si$_8$
45. 40 01-e 49 íb-⌜si$_8$⌝
41 40-e 50 íb-⌜si$_8$⌝

Side e

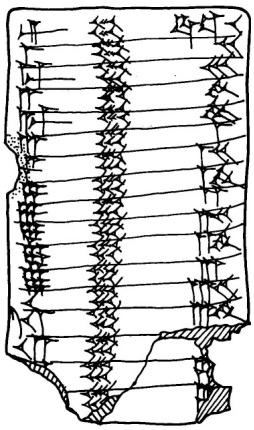
1. [43 21-e 51 íb-si$_8$]
[45 04-e 52 íb-si$_8$]
[46 49-e 53 íb-si$_8$]
[48 36-e 54 íb-si$_8$]
5. [50 25-e 55 íb-si$_8$]
[52 16-e 56 íb-si$_8$]
[54 09-e 57 íb-si$_8$]
[56 04-e 58 íb-si$_8$]
58 01-[e 59 íb-si$_8$]
10. 1-[e 1 íb-si$_8$]
==========
1-[e 1 ba-si$_8$]
⌜8⌝-[e 2 ba-si$_8$]
2[7-e 3 ba-si$_8$]
1 04-[e 4 ba-si$_8$]
15. 2 [05-e 5 ba-si$_8$]
3 [36-e 6 ba-si$_8$]
5 [43-e 7 ba-si$_8$]
8 [32-e 8 ba-si$_8$]
12 [09-e 9 ba-si$_8$]
20. 16 [40-e 10 ba-si$_8$]
22 1[1-e 11 ba-si$_8$]
2⌜8⌝ [48-e 12 ba-si$_8$]
36 [37-e 13 ba-si$_8$]
⌜45⌝ [44-e 14 ba-si$_8$]
[…

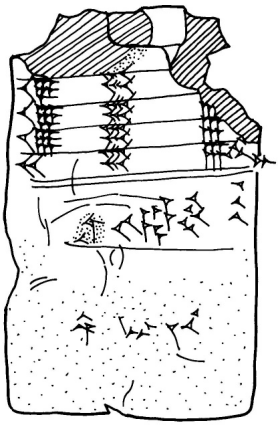
Side f

(Missing)

10. Ashmolean 1923.410

Almost complete Type III tablet, with lower edge missing. Metrological table of weights, with semi-erased day of composition on lower half of reverse. Numerals in ‘mathematical’ format; ruled.





Obverse

1.	1/2 še kù-babbar	10
	1 še	20
	1 1/2 še	30
	2 še	40
5.	2 1/2 še	50
	3 še	1
	4 še	1 20
	5 še	1 40
	6 še	2
10.	7 še	2 20
	8 še	2 40
	9 še	3
	10 še	3 20
	11 še	3 40
15.	12 še	[4]
	[13] še	4 [20]
	[14] še	4 [40]

Reverse

1.	[15 še	5]
	[16 še	5 20]
	17 še	[5 40]
	18 še	⌜6⌝
5.	19 še	6 [20]
	20 še	6 40

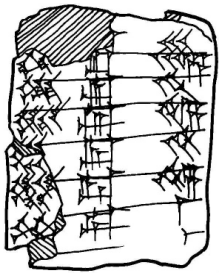
==========

ud-27-kam (‘Day 27’)

(illegible traces)

11. Ashmolean 1923.414

Type III tablet: metrological table of very large area measures (1 bùr = 1800 sar, *c*.6 1/2 ha); ruled; reverse blank.



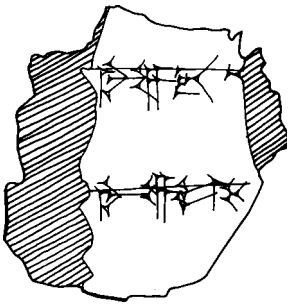
Obverse

1.	[3600 (bùr)] ⌜ganá⌝	30 00 00 00
	3600 + 600 (bùr) ganá	35 00 00 00
	3600 + 2 600 (bùr) ganá	40 00 00 00
	3600 + 3 600 (bùr) ganá	45 00 00 00
5.	⌜3600 + 4 600 (bùr)⌝ ganá	50 00 00 00
	3600 + 5 600 (bùr) ganá	55 00 00 00
	2 3600 (bùr) ganá	1 00 00 00 00

12. Ashmolean 1932.526n

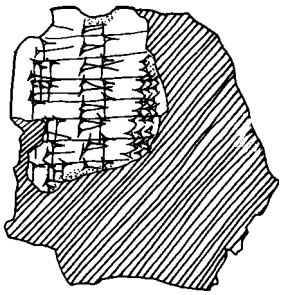
Fragment from bottom left corner of Type II tablet. Obverse: extract from the Old Babylonian List of Trees and Wooden Objects (OB Ur_5-ra tablet I). The second entry corresponds to line 182 of the OB Nippur version (Veldhuis 1997: 155); in the Standard

Babylonian Ur_5-ra = *ḫubullu* these entries can be found in Tablet IV lines 74 and 76. Reverse metrological list of capacities; ruled. 1 silà = *c.*1 litre.



Obverse

…]	…]
[ĝiš]-gu-za-zag-⸢bi⸣-[ús]	Chair with footstool
[ĝiš]-gu-za-⸢aratta⸣[ki]	Chair from Aratta

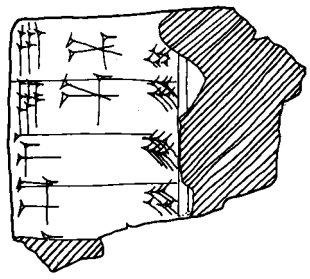


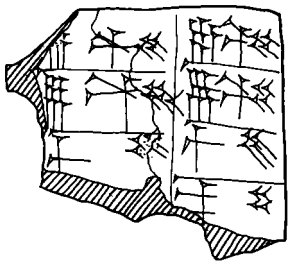
Reverse

1. ⸢1/3⸣ silà [še]
   1/2 silà [še]
   2/3 silà ⸢še⸣
   5/6 silà še
5. 1 silà še
   [1] 1/3 silà še
   ⸢1⸣ 1/2 silà še
   1 2/3 ⸢silà⸣ [še]
   [1] ⸢5/6⸣ [silà še]
   […

13. Ashmolean 1933.180

Fragment of a Type II (?) tablet: metrological list of capacities; ruled. Apparently a single extract written repeatedly; numerals in 'mathematical' format. The tablet turns left–right, not top–bottom. 1 bán = 10 silà = *c.*10 litres.





Obverse and reverse

1. 8 silà še
   9 silà še
3. 1 (bán) še
   2 (bán) še
   […

14. Bodleian AB 216

Type III tablet containing a mathematical problem, set and solved, with a numbered diagram. The tablet is identical in size, shape and format to AB 212–215 and AB 217, strongly suggesting that they are all from the same findspot, if not written by the same scribe (see Plate I and Table 4). The four other tablets bear incantations, which are not normally found in the archaeological assemblages of Old Babylonian scribal schools, with the possible exception of the so-called 'scholar's library' at Me-Turan (Tell Haddad) (Cavigneaux 1999).

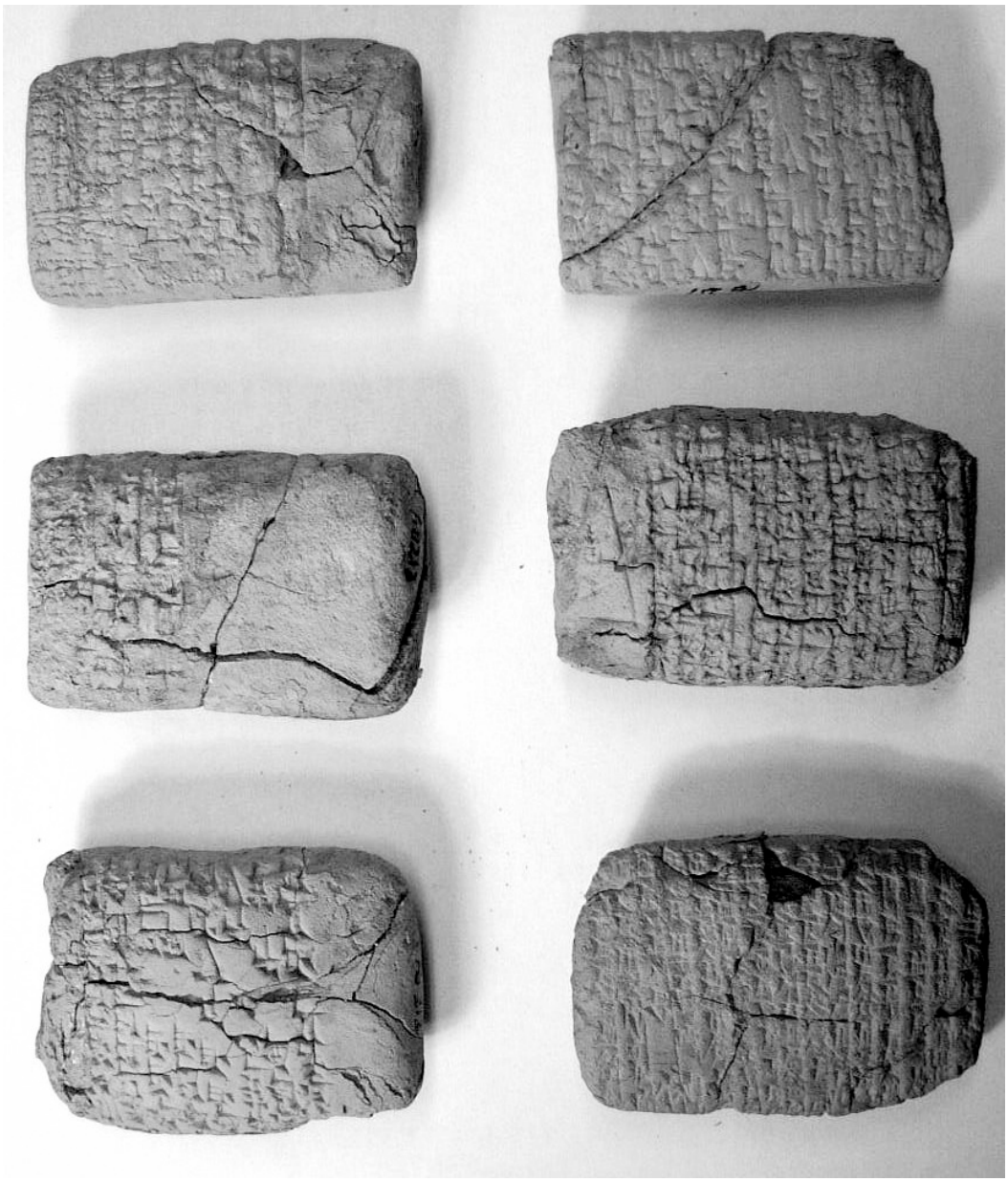
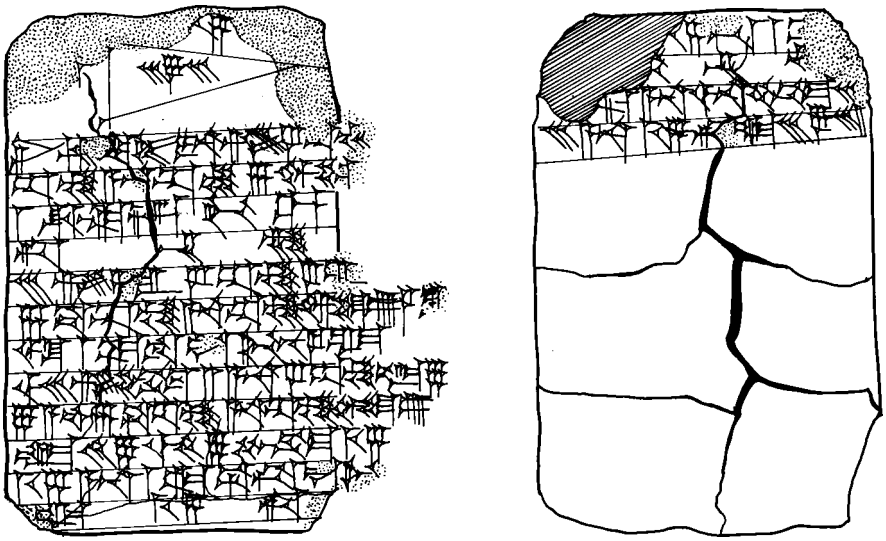


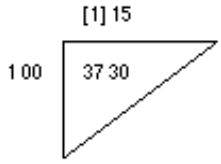
Plate I: Bodleian tablets AB 212– 217 (rotated 90° anticlockwise)
AB 216 is in the middle of the bottom row

Table 4: Bodleian tablets catalogued with AB 216

Tablet	*Contents*	*Publication*
AB 212	Elamite incantation for a woman in childbirth	*OECT* 11: 5; Cunningham 1997: 420a
AB 213	7 or 8 lines; illegible	—
AB 214	Akkadian incantation against wind	*OECT* 11: 3; Cunningham 1997: 354
AB 215	Akkadian incantation to soothe a crying baby	*OECT* 11: 2; Cunningham 1997: 353
AB 217	Akkadian incantation against the bite of a dog	*OECT* 11: 4; Cunningham 1997: 355



Obverse



1. *ni-*⌜*ik-ka*⌝*-súm i-na* GI 4 ⌜AB.SÍN⌝
AB.SÍN *a-na* AB.SÍN 6 *im-ṭú-*[*ú*]
1 *šu-ši* SAĞ ⌜*al*⌝*-gu-un*
UŠ EN.NAM

Calculation. In 1 reed there are 4 furrows. Furrows decrease on furrows by 0;06 (rods). I …ed a width of 1 00, (namely) sixty (rods). What is the length?

5. 30 GI ⌜ĞAR.RA⌝ 4 AB.SÍN ĞAR.⌜RA⌝
6 *ša* AB.SÍN *a-na* AB.SÍN *im-ṭú-ú* ĞAR.⌜RA⌝
ù 1 SAĞ *ša* ⌜*il*⌝*-gu-nu* ĞAR.RA-*ma*

Put down 0;30, a reed. Put down 4, the furrows. Put down 0;06 by which furrows decrease on furrows. Put down 1 00, the width which he …ed, and then:

IGI 30 GI *pu-ṭur-ma*ˡ 2 *a-na* 4 AB.SÍN ÍL 8
10. 8 *a-na* 6 *ša* AB.SÍN *a-na* AB.SÍN *im-ṭú-ú*
ÍL 48 IGI 48 *pu-ṭur-ma* 1 15
1 15 *a-na* 1 SAĞ *ša ta-*⌜*al-gu*⌝-[*nu*]
ÍL 1 15 UŠ

[1]Solve the reciprocal of 0;30, a reed: 2. [2]Multiply 2 by 4, the furrows: 8. [3]Multiply 8 by 0;06, by which furrows decrease on furrows: 0;48. [4]Solve the reciprocal of 0;48: 1;15. [5]Multiply 1;15 by 1 00 the width which you …ed: 1 15, the length.

Reverse

1. [*šum-ma* 1] ⌜15 UŠ⌝ 1 ⌜SAĞ⌝
[A.ŠÀ].⌜BI⌝ EN.⌜NAM⌝

[If] the length is 1 15 and the width 1 00, what is its [area]?

3. [1] ⌜SAĞ⌝ *a-na ši-na ḫe-pé-ma* ⌜30⌝
30 *a-na* 1 15 ⌜UŠ⌝ ÍL 37 30 A.[ŠÀ]

[6] Break 1 00, the width, in two: 30. Multiply 30 by 1 15, the length: 37 30 (sar) the area.

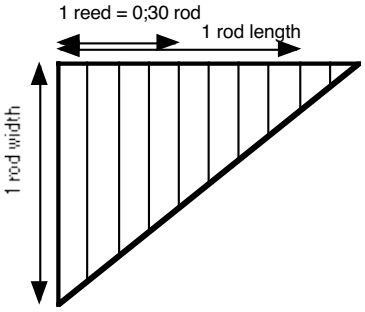
The verb *lagānum* appears to be otherwise unattested, except as the participle *lāginu(m)*, found only in lexical lists, which the dictionaries identify as "an [unidentified] agricultural profession". It presumably describes some kind of agricultural activity here

too, as part of the quasi-realistic setting of the problem in a furrowed field. It is unlikely that the verb is a variant of *šakānum* "to place, set" on two grounds: first, the consonantal shift *š–l* is restricted to occurrences of *š* immediately preceding a dental consonant (namely, *d, t, ṭ*); second, the reading GU = ku_8 is found only in peripheral dialects of Akkadian of the later second millennium BCE.

The Akkadian word *nikkassum* is widely attested in the Old Babylonian period with the meanings 'account, accounting, account record', often written logographically is NÍĞ.KAS$_7$ = NÍĞ.ŠID (*CAD* N II: *nikkassu* A 1b). Hitherto it has only been known to mean 'calculation' (as it appears to here) in a few first millennium mathematical contexts (*CAD* N II: *nikkassu* A 2). More usually the first word or phrase of Old Babylonian mathematical problems indicates the subject matter very specifically.

Spellings such as TU = *ṭú* (obverse lines 2, 6, 9) and BI = *pé* (reverse line 3) suggest a provenance around Uruk (Goetze 1945: 146–147). Usages such as ZA = *sà*, ZI = *sí*, ZU = *sú*, AZ = *as* in the incantations AB 214, 215, and 217 (*OECT* 11: pp. 19–23) are consistent with this conclusion.

The structure of the solution is as follows:



[1] How many reeds per rod? 2
[2] How many furrows per rod? 2 × 4 = 8
[3] How much decrease in furrow length per rod length of field? 8 × 0;06 rods = 0;48 rods
[4] How many rods length of field per 1 rod decrease in furrow length (1 rod width of field)? 0;48 ~ 1;15
[5] How long is the field? 1 00 × 1;15 = 1 15
[6] What is the area of the field? 1 00/2 × 1 15 = 37 30 sar [or 2250 sar = 1 bur 4 1/2 iku].

There are several known OB problems and diagrams on the topic of 'striped triangles' and 'striped trapezoids', as Friberg (1990: 558–60) has named them — and see **Tablet 8** above. However, those problems are primarily about using similarity principles to find the areas and/or transversals of internal triangles and trapezoids, given the measurements of the outer triangle. This problem, by contrast, is to find the length and area of a triangle given the width and the slope of the hypotenuse, using a furrowed field as a pretext to describe the set up with the comparative phrase *absinnū ana absinnī* 6 *imṭû* 'furrows decrease on furrows by 0;06'. It is the first instance in OB mathematics known to me of the verb *maṭûm* 'to decrease, diminish' to describe a constant relationship between many mathematical objects; more usually it is used to compare one length with another (Høyrup 2002: 21) in setting up 'algebraic' problems. Vertical slopes — of walls, canals, and other structures — are by contrast almost exclusively described using the logogram written GU$_7$ or KÚ (most recently Robson 2001: 183 n19).

Old Babylonian tablets from Kish, findspot unknown

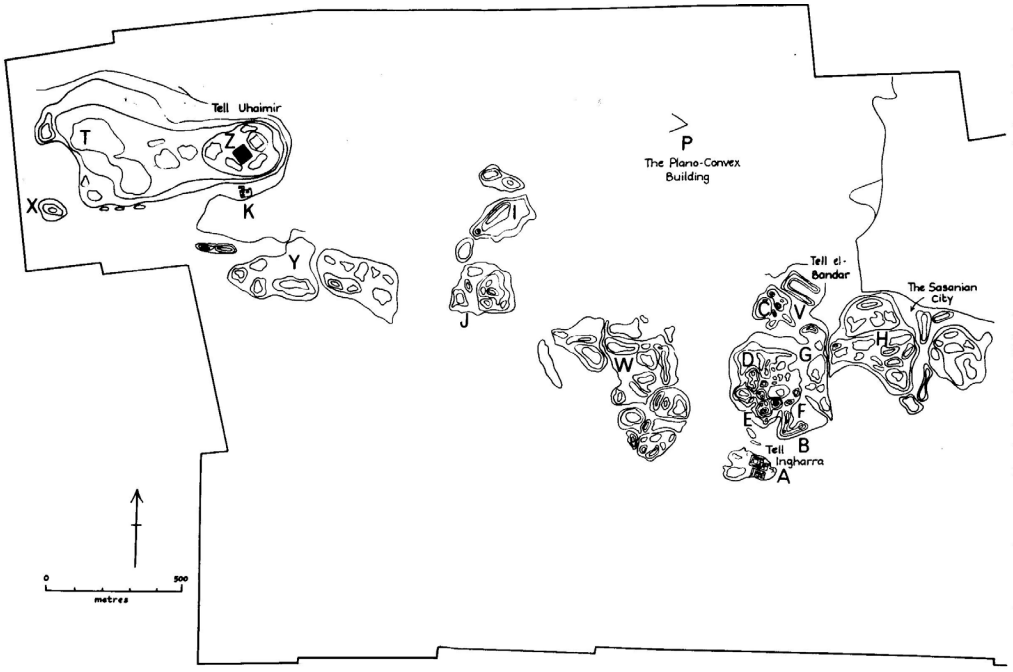


Figure 1: The mounds of Kish (Moorey 1978: Fig. C)

Excavations at Kish

The city of Kish, about 12 km east of Babylon, was excavated by a joint expedition of the Field Museum, Chicago and the University of Oxford (OFME) over the decade 1923–33, following over a century of explorations by various travellers and archaeologists (Moorey 1978: 1–13). The OFME's results were reworked by McGuire Gibson (1972) and Roger Moorey (1978). There is both textual and archaeological evidence for occupation from the fifth millennium BCE onwards, with particularly important material from the Early Dynastic and Akkadian periods (*c*.3000–2300 BCE), the Old Babylonian period (*c*.1900–1650 BCE) and Neo-Assyrian, Neo-Babylonian, Achaemenid and early Seleucid periods (*c*.750–300 BCE). The ruins of Kish today comprise some 40 tells over an area 8 km east to west and 2 1/2 km north to south (Moorey 1978: xx). According to the extant field records, mathematical tablets were found on three of those mounds: Z, W, and E moving west to east in order of excavation (Figure 1). Others, however, have no localised provenance within the city of Kish.

15. Ashmolean 1924.590

Fragment from upper right corner of Type III tablet. Verbose reciprocal table, with colophon giving month and day of composition; ruled. The phonetic complement ^{bi} indicates that '2/3' should be read as the Sumerian šanabi 'two-thirds'.

Obverse

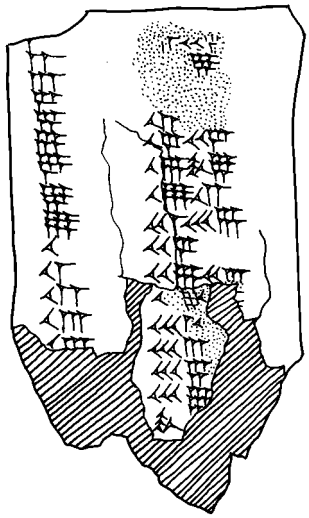
[géš-da 2/3]-⌜^{bi}⌝-bi 40-àm	[Two-thirds of sixty] is 40
[šu]-⌜ri⌝-a-bi 30-àm	Half of it is 30
[igi 2]-⌜gál-bi 30⌝	[A 2nd] part of it (is) 30
[…	[…

Reverse

…]		…]
[igi 1] ⌜21-ğál-bi 44 2⌝[6 40]		[A 1] 21th part of it is 0;44 2[6 40]
==========		==========
[(…)] ⌜iti⌝ šu-numun-a ud-8-kam		[(…)] Month IV, day 8.

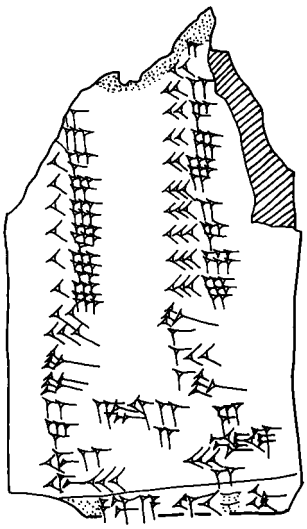
16. Ashmolean 1929.833

Large Type III tablet, with lower portion missing. Terse multiplication table for 2;24 on obverse and 2 on reverse, ending with the square, inverse square (íb-si$_8$), and reciprocal (igi) for each head number. Numerals in 'mathematical' format; not ruled. Colophon gives month and day of composition.



Obverse

1.	1	⌜2 24⌝
	2	[4 4]8
	3	[7 12]
	4	[9 36]
5.	5	12
	6	14 24
	7	16 48
	8	19 12
	9	21 36
10.	10	24
	11	26 24
	12	⌜28 48⌝
	13	31 [12]
	⌜14⌝	33 [36]
15.	[15]	36!
	[16]	38 [24]
	[17]	40 [48]
	[…]	



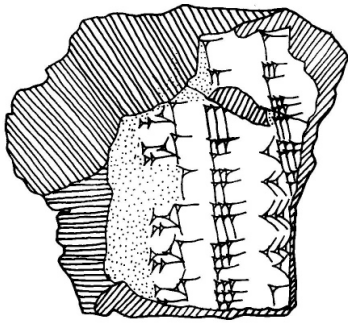
Reverse

	…]	
1′.	[9]	⌜18⌝
	[10]	20
	[11]	22
	[1]2	24
5′.	[1]3	26
	14	28
	15	30
	16	32
	17	34
10′.	18	36
	19	38
	20	40
	30	1
	40	1 20
15′.	50	1 40
	2 a-rá 2	4

	4	2 íb-si$_8$
	igi 2	30
	igi 30	2
20′.	[(…)] ⌜iti⌝ zíz-a ud-14+-kam	
	(‘Month XI, day 14+’)	

17. Ashmolean 1924.1214

Surface fragment of a Type I (?) tablet; reverse missing. Table of squares in verbose format. Numerals written in ‘mathematical’ format; unruled.

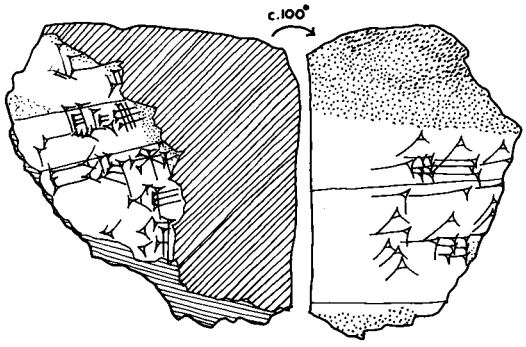


Obverse

1.	[1 a-rá] 1	1
	[2 a-rá] ⌜2⌝	4
	[3 a]-⌜rá⌝ 3	9
	[4 a]-rá 4	16
5.	[5 a]-⌜rá⌝ 5	2⌜5⌝
	[6 a]-rá 6	3[6]
	[7 a]-rá 7	4[9]
	[8 a]-rá 8	1 [04]
	[…]	

18. Ashmolean 1930.365

Two tablets squashed together, probably in the process of recycling (cf. Faivre 1995). The ‘obverse’ has finely written but malformed Sumerian in ruled lines: either proverbs or a standard list of personal names; the ‘reverse’ has the first two columns of a tabular calculation at right angles to the ‘obverse’. Their disposition is identical to the first two columns of the tables on the unprovenanced Old Babylonian tablets YBC 7375 and YBC 11125 (*MCT*: 17–19), which are themselves related to a series of problems on market rates on VAT 7530 (*MKT*: I 287–289). The second column thus gives prices for 16 41 = 7 × 11 × 13 units of a commodity when the market rates are 7, 11, 13, and 14 units per shekel respectively (Friberg 1990: 547).



‘Obverse’

…]
[…] X […
[…] en šul? […⌝
[…] bi šà an […]
[…] na […]
[…] el? […]

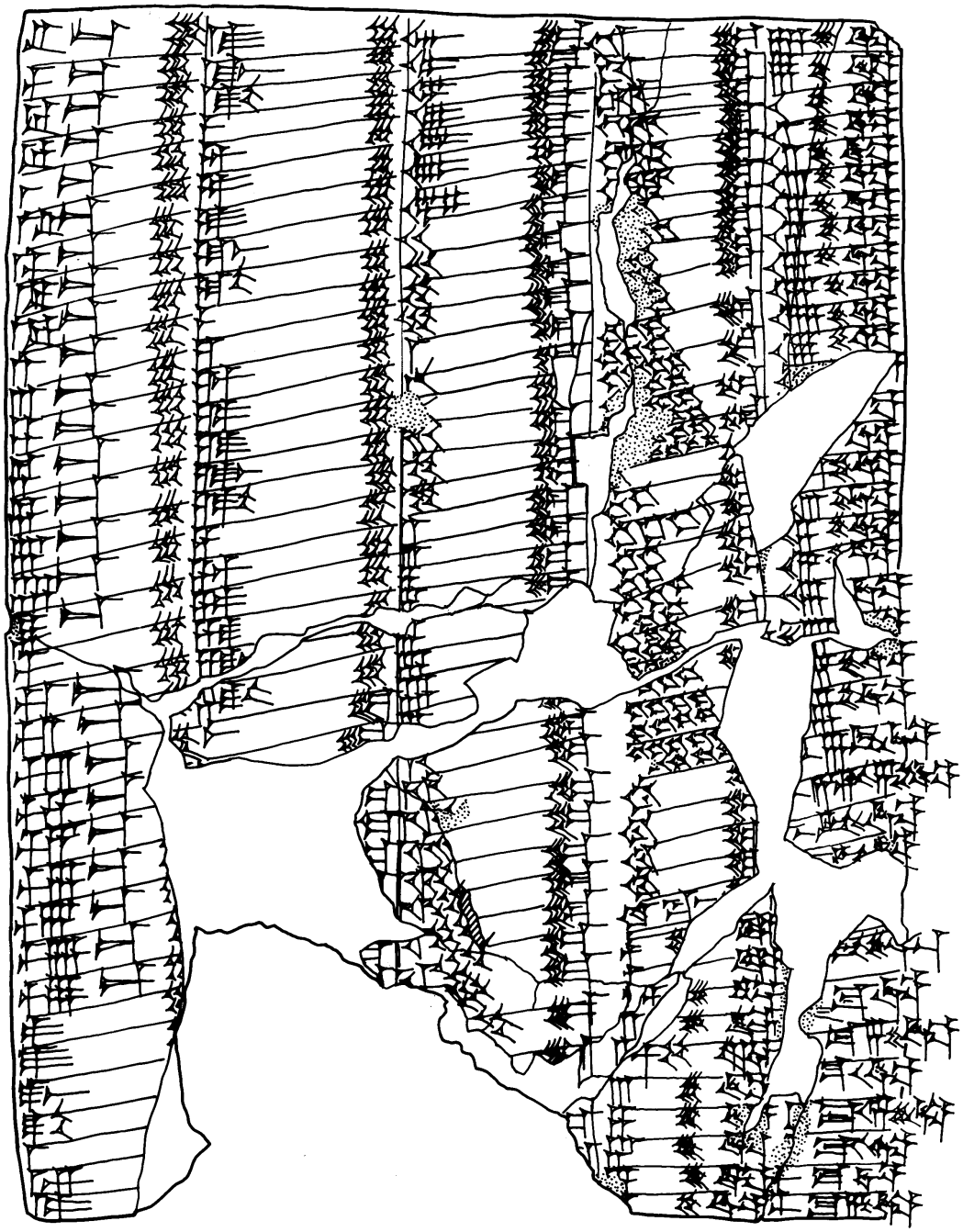
‘Reverse’

[7]	[2 23]	[…]
11	1 ⌜31⌝	[…]
13	1 17	[…]
14!	1 11 30	[…]

19. Ashmolean 1931.137

Type I tablet glued together from many fragments, with portions of the lower part missing; five columns per side. Metrological list of capacities (še, še-gur), weights (kù-babbar, ‘silver’; here sometimes abbreviated kù-b. for reasons of space), and areas (a-

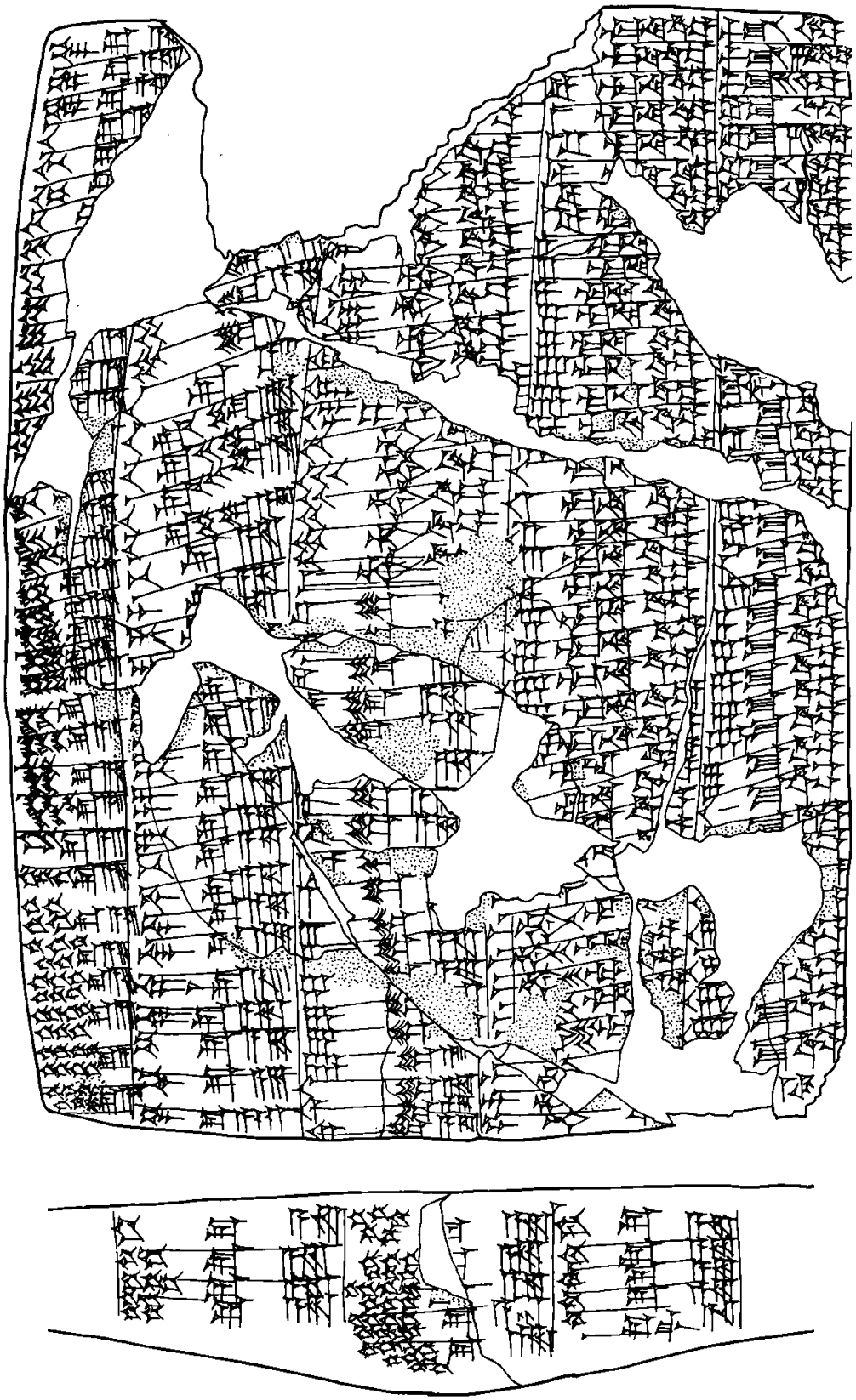
šà). Numerals in 'non-mathematical' format; ruled. Recorded in the Ashmolean card index of tablets as coming from Kish, but missing from the inventory of Kish tablets also held in the Ashmolean.



Capacity measures: 1 gur = 5 bariga = 30 bán = 300 silà = *c*.300 litres
Weight measures: 1 gún ('talent') = 60 ma-na ('mina') = *c*.30 kg
1/60 mina = 1 gín = 180 še ('grain') = *c*.8 grams
Area measures: 1 bùr = 3 ešè = 18 iku = 1800 sar = *c*.6 1/2 ha

Obverse

	Column i	*Col. ii*	*Column iii*	*Column iv*	*Column v*
1.	1/3 silà še	0.1.3 še	13 (gur) še-gur	3600 (gur) še-gur	8 še kù-babbar
	1/2 silà še	0.1.4 še	14 (gur) še-gur	3600 ‹+ 600› (gur) še-gur	9 še kù-babbar
	2/3 silà še	0.1.5 še	15 (gur) še-gur	3600 + 2 600 (gur) še-gur	10 še kù-babbar
	5/6 silà še	0.2.0 še	16 (gur) še-gur	3600 + 3 600 (gur) še-gur	11 še kù-babbar
5.	1 silà še	0.2.1 še	17 (gur) še-gur	3600 + 4 600 (gur) še-gur	12 še kù-babbar
	1 1/3 silà še	0.2.2 še	18 (gur) še-gur	⌜3600⌝ + 5 600 (gur) še-gur	13 še kù-babbar
	1 1/2 silà še	0.2.3 še	19 (gur) še-gur	⌜2 3600⌝ (gur) še-gur	14 še kù-babbar
	1 2/3 silà še	0.2.4 še	20 (gur) še-gur	⌜3 3600⌝ (gur) še-gur	15 še kù-babbar
	1 5/6 silà še	0.2.5 še	30 (gur) še-gur	⌜4 3600⌝ (gur) še-gur	16 še kù-babbar
10.	2 silà še	«0.2.0 še»	40 (gur) še-gur	⌜5 3600⌝ (gur) še-gur	17 še kù-babbar
	3 silà še	0.3.0 še	50 (gur) še-gur	6 3600 (gur) še-gur	18 še kù-babbar
	4 silà še	0.3.1 še	1 00 (gur) še-gur	⌜7 3600⌝ (gur) še-gur	19 še kù-babbar
	5 silà še	0.3.2 še	1 10 (gur) še-gur	⌜8 3600⌝ (gur) še-gur	⌜20⌝ [še kù]-⌜babbar⌝
	6 silà še	0.3.3 še	[1] ⌜20⌝ (gur) še-gur	⌜9 3600⌝ (gur) še-gur	[21 še kù]-babbar
15.	7 silà še	0.3.4 še	1 30 (gur) še-gur	⌜3600 (gur) še-gur⌝ (*sic*)	[22 še] kù-babbar
	8 silà še	0.3.5 še	1 40 (gur) še-gur	2 3600 (gur) ⌜še-gur⌝	[22] 1/2 še kù-babbar
	9 silà še	0.4.0 še	1 50 (gur) še-gur	3 3600 (gur) ⌜še-gur⌝	⌜23⌝ še kù-babbar
	0.0.1 še	0.4.1 še	2 00 (gur) še-gur	4 3600 (gur) ⌜še-gur⌝	24 še kù-babbar
	0.0.1 1 silà še	0.4.2 še	3 00 (gur) še-gur	5 3600 (gur) še-gur	25 še kù-babbar
20.	0.0.1 2 silà ⌜še⌝	0.4.3 ⌜še⌝	4 00 (gur) še-gur	6 3600 (gur) še-gur	26 [še] kù-babbar
	0.0.1 3 silà ⌜še⌝	0.4.4 ⌜še⌝	5 00 (gur) še-gur	⌜7 3600 (gur) še-gur⌝	⌜27⌝ [še] ⌜kù-babbar⌝
	0.0.1 4 silà [še]	0.⌜4⌝.5 še	⌜6⌝ 00 (gur) [še-gur]	8 3600 (gur) [še-gur]	⌜28⌝ še kù-babbar
	0.0.1 5 silà [še]	1.0.0 še-gur	7 00 (gur) [še-gur]	9 3600 (gur) [še-gur]	⌜29⌝ še kù-babbar
	0.0.1 6 silà ⌜še⌝	[1.1.0] še-gur	8 00 (gur) [še-gur]	36,000 (gur) še-[gur]	⌜igi⌝-6-ĝál kù-babbar
25.	0.0.1 7 silà ⌜še⌝	[1.2.0 še-gur]	⌜9 00 (gur) še-gur⌝	36,000 (gur) še-⌜gur⌝	⌜igi⌝-6-ĝál 5 še kù-b.
	0.0.1 8 silà ⌜še⌝	[1.3.0 še]-gur	600 (gur) še-gur	36,000 (gur) še-gur	⌜igi⌝-‹6›-ĝál 10 kù-b.
	0.0.1 9 silà ⌜še⌝	[1.4.0 še]-gur	600 + 1 00! še-gur	36,000 (gur) še-gur	[igi-4]-⌜ĝál⌝ kù-b.⌝
	0.0.2 ⌜še⌝	[2] ⌜še⌝-gur	600 + 2 00! še-gur	36,000 gal (gur) ⌜še-gur⌝	[igi-4-ĝál 5 še kù-b.]
	0.0.3 ⌜še⌝	[3 še]-⌜gur⌝	600 + 3 00! še-gur	==========	[igi-4]-ĝál ‹10› še ⌜kù-b.⌝
30.	0.0.4 [še]	[4 še]-⌜gur⌝	600 + 4 00! še-gur	1/2 še kù-babbar	[1/3] gín kù-babbar
	0.0.5 [še]	[5 še-gur]	600 + 5 00! še-gur	1 [še] kù-babbar	[1/3] gín 5 še kù-b.
	0.1.0 [še]	[6 še]-⌜gur⌝	600 + 6 00! še-gur	⌜1⌝ 1/2 še kù-babbar	[1/3] gín 10 kù-b.
	0.1.1 «1» [še]	[7 še]-⌜gur⌝	600 + 7 00! še-gur	2 še kù-babbar	⌜1/3⌝ gín 15 še kù-b.
	0.1.2 [še]	[8 še-gur]	[600 +]⌜8 00!⌝ še-gur	2 1/2 še kù-babbar	[1/3] gín 20 kù-b.
35.		[9 še-gur]	[600 +]⌜9 00!⌝ še-gur	3 še kù-babbar	1/2 gín kù-babbar
		[10 še-gur]	[2 600] ⌜še-gur⌝	4 še kù-babbar	1/2 gín 5 še! kù-b.
		[11 še-gur]	[3 600 še-gur]	5 še kù-babbar	
		[12 še-gur]	[4 600 še]-⌜gur⌝	⌜6⌝ še kù-babbar	
			[5 600 še]-⌜gur⌝	⌜7⌝ še kù-babbar	



Reverse

Column x	*Column ix*	*Column viii*	*Column vii*	*Column vi*	
0.2.3 ganá a-⌜šà⌝	[13 sar a-šà]	[5 gún kù-b.]	[1/2] ma-na kù-babbar	1/2 gín 10 kù-b.	1.
0.2.4 ganá a-⌜šà⌝	[14 sar a-šà]	[6 gún kù-b.]	[2/3] ma-na kù-babbar	1/2 gín 15 še! kù-b.	
0.2.5 ganá a-⌜šà⌝	[15 sar a-šà]	[7 gún kù-b.]	5/6 ma-na kù-babbar	1/2 gín 20 kù-b.	
1.0.0 ganá a-⌜šà⌝	[16 sar a-šà]	[8 gún kù]-b.]	1 ma-na kù-babbar	2/3 gín kù-babbar	
1.1.0 ganá [a-šà]	[17 sar a-šà]	[9 gún kù]-b.	1 1/3 ma-na kù-babbar	2/3 gín 5 še kù-b.	5.
1.2.0 ⌜ganá⌝ [a-šà]	[18 sar a-šà]	[10 gún] kù-b.	1 1/2 ⌜ma-na⌝ kù-b.	2/3 gín 10 kù-b.	
2.0.0 ⌜ganá⌝ [a-šà]	[19 sar a-šà]	[11] ⌜gún⌝ kù-b.	1 2/3 [ma-na] kù-b.	2/3 gín ⌜15⌝ kù-b.	
3.0.0 [ganá a-šà]	[20 sar a-šà]	[12] ⌜gún⌝ kù-b.	1 5/6 ⌜ma⌝-[na kù]-b.	[2/3 gín] ⌜20⌝ kù-b.	
4.0.0 [ganá a-šà]	[30] ⌜sar a-šà⌝	[13] ⌜gún⌝ kù-b.	2 ma-na [kù-babbar]	[5/6 gín] ⌜kù⌝-b.	
5.0.0 [ganá a-šà]	40 sar a-šà	⌜14 gún⌝ kù-b.	3 ma-na [kù-babbar]	[5/6 gín 5 kù]-b.	10.
6.0.0 [ganá a-šà]	«50 sar ⌜a-šà⌝»	15 gún kù-b.	4 ma-na kù-[babbar]	[5/6 gín 10 kù-b.]	
7.0.0 ⌜ganá⌝ a-šà	0.0.1/2 ganá a-⌜šà⌝	16 gún kù-b.	5 ma-na kù-[babbar]	[5/6 gín 15 kù-b.]	
8.0.0 ⌜ganá⌝ a-šà	0.0.1/2 ganá 10 sar a-šà	⌜17⌝ gún kù-b.	6 ma-na kù-babbar	[5/6 gín 20 kù-b.]	
⌜9.0.0 ganá⌝ a-šà	0.0.1/2 ganá 20 sar a-šà	⌜18 gún⌝ kù-b.	7 ma-na kù-babbar	1 šu-ši ⌜X X⌝ [kù-b.]	
[10.0.0 ganá a-šà]	0.0.1/2 ganá 30 sar a-šà	19 ⌜gún⌝ [kù]-⌜b.⌝	8 ma-na kù-babbar	1 gín kù-[babbar]	15.
11.0.0 ⌜ganá⌝ a-šà	0.0.1/2 ganá 40 sar a-šà	20 gún ⌜kù⌝-[b.]	⌜9⌝ ma-na kù-babbar	1 1/3 gín kù-babbar	
12.0.0 ⌜ganá⌝ a-šà	‹0.0.1 ganá a-šà›	30 gún kù-b.	10 ⌜ma-na kù-babbar⌝	[1 1/2] gín kù-b.	
13.0.0 ⌜ganá⌝ a-šà	0.01 1/2 ganá a-šà	40 gún kù-b.	11 ma-na kù-⌜babbar⌝	‹1› 2/3 ⌜gín kù⌝-b.	
14.0.0 ganá a-šà	0.0.2 ⌜ganá⌝ a-šà	50 gún kù-b.	12 ma-na kù-babbar	‹1› 5/6 gín [kù-b.]	
15.0.0 ganá a-šà	0.0.2 1/2 ⌜ganá a⌝-šà	1 00 gún kù-[b.]	13 ma-na kù-babbar	«1» ‹2› gín kù-b.	20.
16.0.0 ganá a-šà	0.0.3 [ganá a-šà]	==========	14 ma-na kù-babbar	3 gín kù-babbar	
17.0.0 ganá a-šà	[0.0.3 1/2] ⌜ganá⌝ [a-šà]	1/3 sar [a-šà]	15 ma-na kù-babbar	4 gín kù-babbar	
18.0.0 ganá a-šà	⌜0.0.4⌝ ganá a-⌜šà⌝	⌜1/2 sar a-šà⌝	16 ma-na kù-babbar	5 gín kù-babbar	
‹19.0.0 ganá a-šà›	⌜0.0.4⌝ 1/2 ganá ⌜a-šà⌝	2/3 sar ⌜a-šà⌝	17 ma-na kù-babbar	6 gín kù-babbar	
20.0.0 ganá [a-šà]	0.0.5 ganá a-šà	⌜5/6⌝ sar a-šà	⌜18⌝ ma-na kù-babbar	7 gín kù-babbar	25.
30.0.0 ganá a-⌜šà⌝	0.0.5 1/2 ganá a-šà	[1] sar a-šà	⌜19⌝ ma-na kù-babbar	8 gín kù-babbar	
40.0.0 ganá a-šà	0.1.0 ganá a-šà	[1 1/3 sar] a-šà	[20] ma-na kù-babbar	9 gín kù-babbar	
50.0.0 ganá a-šà	0.1.1 ganá a-šà	1 1/2 sar a-⌜šà⌝	[30 ma]-na kù-babbar	10 gín kù-babbar	
‹60 (bùr) ganá a-šà›	0.1.2 ganá a-šà	1 2/3 sar a-⌜šà⌝	[40 ma]-na kù-babbar	[11] ⌜gín⌝ kù-b.	
2 60 ganá a-šà	0.1.3 ganá a-šà	1 ⌜5/6 sar⌝ [a-šà]	[50 ma]-⌜na kù-babbar⌝	[12 gín] ⌜kù⌝-b.	30.
3 60 ganá a-šà	0.1.4 ganá a-⌜šà⌝	2 sar ⌜a⌝-[šà]	⌜1 gún⌝ [kù-babbar]	⌜13⌝ [gín kù]-⌜b.⌝	
4 60 ganá a-šà	0.1.5 ganá a-šà	3 sar ⌜a⌝-[šà]	1 gún 10 ma-[na kù-b.]	14 [gín kù]-⌜babbar⌝	
5 60 ganá a-šà	0.2.0 ganá a-šà	⌜4⌝ sar a-šà	1 gún 20 ⌜ma-na kù-b.⌝	⌜15⌝ [gín] ⌜kù⌝-b.	
6 60 ganá a-šà	0.2.1 ganá a-šà	5 ⌜sar⌝ a-šà	1 gún 30 ma-⌜na kù⌝-b.	16 ⌜gín⌝ kù-babbar	
7 60 ganá a-šà	0.2.2 ganá a-šà	6 ⌜sar⌝ [a]-⌜šà⌝	1 [gún] 40 ma-⌜na kù⌝-b.	⌜17⌝ gín kù-babbar	35.
8 60 ganá a-šà		7 sar [a-šà]	⌜1 gún⌝ 50 ma-[na kù-b.]	[18] gín kù-babbar	
⌜9 60⌝ ganá a-šà		8 sar a-⌜šà⌝	2 ⌜gún⌝ [kù-babbar]	[19] ⌜gín kù⌝-[b.]	
		‹9 sar a-šà›	3 ⌜gún⌝ [kù-babbar]	[1/3 ma-na kù-b.]	
		10 sar a-šà	4 gún ⌜kù⌝-[babbar]		
		11 sar a-šà			40.
		12 sar a-šà			

	Left edge i	*Left edge ii*	*Left edge iii*
1.	3600 (bùr) ganá a-šà	5 3600 (bùr) ⌜ganá⌝ a-šà	36,000 (bùr) ganá a-šà
	2 3600 ganá a-šà	6 3600 ⌜ganá⌝ a-šà	36,000 ganá a-šà (*sic*)
	3 3600 ganá a-šà	7 3600 ⌜ganá⌝ a-šà	36,000 ganá a-šà
	4 3600 ganá a-šà	8 3600 ganá a-šà	36,000 ganá a-šà
5.		9 3600 ganá a-šà	36,000 ganá gal a-šà

There are two types of errors in this table. Simplest to explain are errors of omission and addition, whether of whole lines or single signs, as in lines i 33 (additional sign), ii 10 and ix 11 (additional lines), vi 18–20 (omitted signs), viii 38, ix 17, and x 24, 29 (omitted lines). Such lapses are common in long and repetitive lists. But there are also passages in which the scribe does not follow (perhaps because he does not understand) the standard Old Babylonian metrological notation. The problems start at line iii 26 as the capacity list reaches 600 gur, here written in the 'non-mathematical' notation DIŠ+U. The following line appears to be correctly DIŠ+U DIŠ+U = 2 600 (gur), after which we might expect 3 600 gur and so on up to ŠÁR = 3600 gur in line 32. Instead, the scribe appears to understand the final Winkelhaken of line 27 as a 10 sign, generating in the following lines a sequence running from DIŠ+U DIŠ U (=10) in line 27 to DIŠ+U DIŠ ⌜9 U⌝ in line iii 35. The remainder of the column is broken but we may conjecture that it then reverted to the correct sequence DIŠ+U DIŠ+U = 2 600 to 5 600, arriving at ŠÁR = 3600 in line iv 1. The ŠÁR measures continue correctly until line iv 14, after which the sequence appears to revert to ŠÁR again where we expect ŠÁR U = 36,000 and then ŠÁR U + *n* ŠÁR where *n* = 1–9. Four of the final five lines of the capacity list (iv 24–28) comprise the single sign ŠÁR U = 36,000 instead of ŠÁR *m* where *m* = 20, 30, 40, 50. The expected ŠÁR.GAL = 216,000 appears as the last entry. The last five lines of the area list are similarly erroneous (left edge iii 1–5). Compare BM 96949 (below), a correctly written capacity list probably from Sippar.

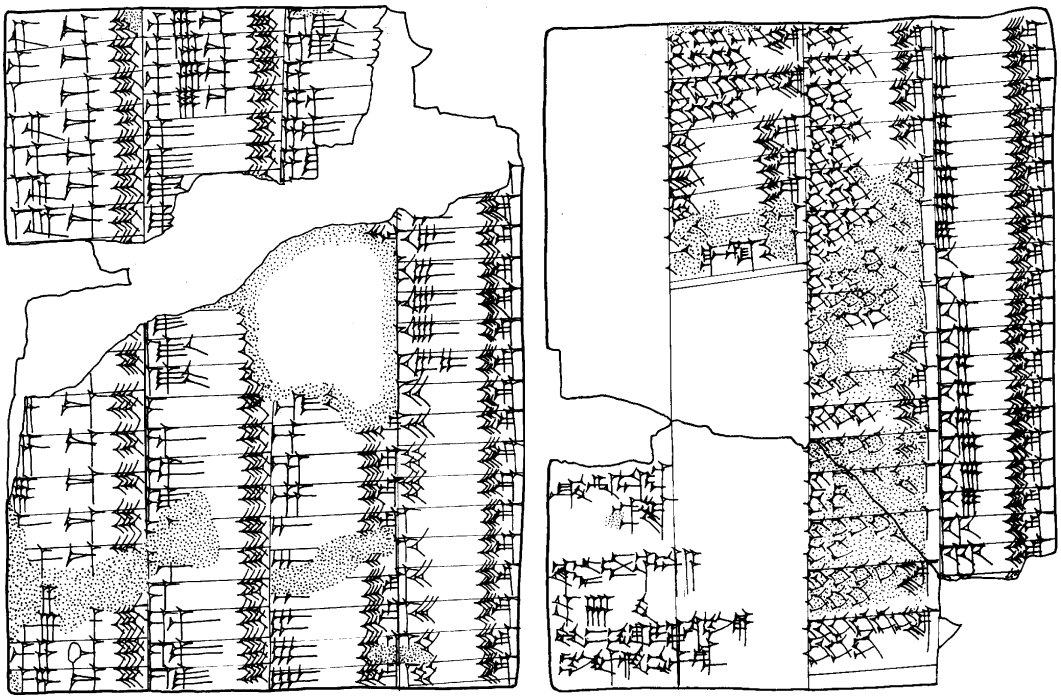
In the following transliteration, for reasons of space I have used the 0.0.0 abbreviation common within Assyriology. In capacity metrology, one should read notation such as 1.2.3 as 1 gur, 2 bariga, 3 bán, where 1 gur = 5 bariga = 30 bán = *c*.300 litres. In area measure, 1.2.3 should be read 1 bùr 2 ešè 3 iku, where 1 bùr = 3 ešè = 18 iku = *c*. 6.5 ha.

BM 96949

Damaged Type I tablet containing a correctly written, shorter version of the standard Old Babylonian capacity list and colophon giving the scribe's name — Ardum (?) — and date — the 14th year of Samsu-iluna's reign = 1735 BCE by the Middle Chronology. Probably from Sippar; measures 15.5 12 2.5 cm.

Although the scribe's name looks like *ḫi-ri-du-um*, no such name is known from late OB Sippar (Richardson 2002: I 382).[7] The best solution appears to be to understand *ar*$^{!}$(= IGI$^{!}$ + RI)-*du-um* ('Slave'), a known Sippar name (Richardson 2002: I 366).

[7] A reading *ḫi-ri-tù-um* ('Ornament') is excluded on two grounds: the value *tù* for DU is found only in Old Assyrian and peripheral dialects, while a feminine name would require the female determinative munus both before it and before dub-sar ('scribe'). The adjacent tablet in the museum sequence, BM 96950, is a Type I tablet carrying a complete copy of the elementary writing exercise Syllable Alphabet A, by an anonymous female scribe (^{munus}dub-sar) in the same year (Lion and Robson 2004).



Obverse

	Column i	*Column ii*	*Column iii*	*Column iv*
1.	1/3 silà ⌜še⌝	0.0.1 6 silà še	⌜0.3⌝.4 ⌜še⌝	[8.0.0 še-gur]
	1/2 silà še	0.0.1 7 silà še	0.3.5 ⌜še⌝	[9.0.0 še-gur]
	1 silà še	0.0.1 8 silà še	0.4.0 ⌜še⌝	[10.0.0 še-gur]
	1 1/3 silà še	0.0.1 9 silà še	0.4.1 [še]	[11.0.0 še-gur]
5.	1 1/2 silà še	0.0.2 še	0.4.2 [še]	[12.0.0 še-gur]
	1 2/3 silà še	0.0.3 še	0.4.⌜3⌝ [še]	[13.0.0 še]-⌜gur⌝
	1 5/6 silà še	0.0.4 ⌜še⌝	⌜0.4⌝.[4 še]	⌜14.0.0⌝ še-gur
	[2 silà] ⌜še⌝	⌜0.0.5⌝ [še]	[0.4.5] ⌜še⌝	15.0.0 še gur
	[3 silà še]	[0.1.0 še]	[1.0.0] ⌜še-gur⌝	16.0.0 še-gur
10.	[4 silà] ⌜še⌝	[0.1.1 še]	[1.1.0 še]-⌜gur⌝	17.0.0 še-gur
	[5] ⌜silà⌝ še	[0.1.2 še]	[1.1.1 še]-⌜gur⌝	18.0.0 še-gur
	[6 silà] še	⌜0.1.3 še⌝	[1.1.2 še]-⌜gur⌝	19.0.0 še-gur
	⌜7⌝ silà še	0.1.4 ⌜še⌝	[1.1.3 še]-⌜gur⌝	20.0.0 še-gur
	⌜8⌝ silà še	0.1.5 ⌜še⌝	[1.1.4 še]-⌜gur⌝	30.0.0 še-gur
15.	9 silà še	0.2.0 še	1.1.⌜5⌝ [še]-⌜gur⌝	40.0.0 še-gur
	⌜0.0.1⌝ «silà» še	0.2.1 še	1.2.0 ⌜še-gur⌝	50.0.0 še-gur
	⌜0.0.1⌝ 1 silà ⌜še⌝	0.2.2 še	1.3.0 še-gur	1 00 (gur) še-gur
	[0.0.1] 2 ⌜silà⌝ še	0.2.⌜3⌝ še	1.4.0 še-gur	1 10 še-gur
	⌜0.0.1⌝ 3 ⌜silà⌝ še	⌜0.2.4⌝ še	2.0.0 še-gur	1 20 še-gur
20.	⌜0.0.1⌝ 4 silà še	⌜0.2.5⌝ še	3.0.0 ⌜še-gur⌝	1 30 še-gur
	0.0.1 5 silà še	0.3.0 še	⌜4.0.0⌝ še-gur	1 ⌜40⌝ še-gur
		0.3.1 še	5.0.0 še-gur	1 50 še-gur
		0.3.2 še	6.0.0 ⌜še-gur⌝	
		0.3.3 še	7.0.0 še-gur	

Reverse

Column iii	*Column ii*	*Column i*	
36,000 + 8! 3600 še-gur	2 3600 še-gur	2 00 še gur	1.
36,000 + 9 3600 še-gur	3 3600 še-gur	3 00 še-gur	
3600 20 še-gur	4 3600 še-gur	4 00 še-gur	
3600 30 še-gur	5 3600 še-gur	5 00 še-gur	
3600 40 še-gur	6 3600 ⌜še⌝-gur	6 00 še-gur	5.
⌜3600 50 še-gur⌝	⌜7 3600 še-gur⌝	7 00 še-gur	
⌜3600⌝ gal-la ⌜še-gur⌝	⌜8 3600 še-gur⌝	8 00 še-gur	
==========	⌜9 3600 še-gur⌝	9 00 še-gur	
	⌜36,000 še-gur⌝	600 še-gur	
	36,000 + 3600 še-gur	600 + 1 00 še-gur	10.
	36,000 + 2 3600 še-gur	600 + 2 00 še-gur	
	36,000 + 3 3600 ⌜še-gur⌝	600 + 3 00 še-gur	
	36,000 + ⌜4 3600 še-gur⌝	600 + 4 00 še-gur	
	36,000 + ⌜5 3600 še-gur⌝	600 + 5 00 še-gur	
	36,000 + 6 3600 še-gur	600 + 6 00 še-gur	15.
	36,000 + 7 3600 še-gur	600 + 7 00 še-gur	
		600 + 8 00 še-gur	
		600 + 9 00 še-gur	
		2 600 še-gur	
		3 600 še-gur	20.
		⌜4 600 še⌝-[gur]	
		[5 600 še-gur]	
		[3600 še-gur]	

Column iv

šu *ar*!-*du-um* dub-sar
iti gan-gan-è-a
ud-8-kam
mu sa-am-su-i-lu-na lugal-e
lugal ní-gi gú-bar-ra

('Hand of Ardum the scribe.
Month IX, day 8.
Year that Samsu-iluna the king
(crushed) the enemy kings.')

Old Babylonian tablets from Kish, Mound Z

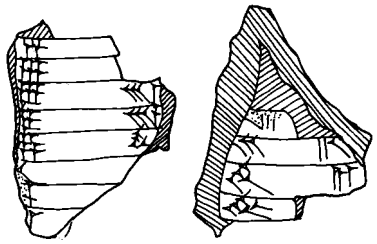
Mound Z: Uhaimir

Mound Z, Arabic name Uhaimir, consists of the remains of the religious centre of Kish proper (Figure 1). At its summit is the ruined ziggurrat called Unir-kitušmaḫ and the associated temple of the god Zababa, called E-mete-ursag̃. It was the first area to be excavated under the OFME's first field director Ernest Mackay, during the first season, 13 March – 28 May 1923. **Tablet 21** was found in Room 5, the central room of a range running along the south east side of the courtyard surrounding the ziggurat (Moorey 1978: plate D, between pp. 24 and 25). It was associated with a building phase attributed to king Samsu-iluna (1749–12 BCE), a metre below a pavement commissioned by king Adad-apla-iddina (1068–47 BCE) (Moorey 1978: 25; Gibson 1972: 72–74). **Tablets 20, 22, and 23** originate from the 'town ruins' to the west of the ziggurat. According to Moorey (1978: 29) Mackay 'revealed at least thirty-five rooms' here, 'though no plans have survived to show how these formed houses or self-contained buildings'. Dated tablets from this area span the period *c*.1880–1650 BCE. The area had already been thoroughly dug over by clandestine excavators even before a short French expedition had yielded very similar finds in 1912 (de Genouillac 1924–25: I 29 note 3). It is clear that in the early second millennium the houses surrounding the temple area, whatever their exact configuration and date, were home to literate people who kept household legal records and who occasionally trained their offspring in literacy and numeracy. They

seem to have been of a comparable socio-economic status to those who lived in areas TA and TB at Nippur (Stone 1987) and areas EH and AM at Ur (Charpin 1986): two contemporary southern cities with more accurately recorded and closely analysed archaeological data.

20. Ashmolean 1924.573

Fragment from the middle of a Type III tablet: multiplication table 4;30 in terse format; ruled. Found in the 'town ruins'. Numerals written in 'mathematical' format; ruled.



Obverse

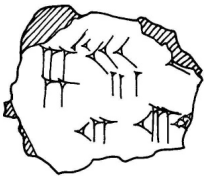
	…]	
1′.	5	[…]
	6	[…]
	7	31 [30]
	8	3⌜6⌝
5′.	9	40 [30]
	10	[…]
	⌜11⌝	[…]
	⌜12⌝	[…]
	[…ˢ	

Reverse

	…]	
1′.	⌜20⌝	[…]
	30	2 ⌜15⌝
3′.	40	3
	50	[…]
	[…ˢ	

21. Ashmolean 1924.586

Small fragment of a Type IV tablet, reverse blank. Found in room 5 of the southeast range of the ziggurat courtyard.

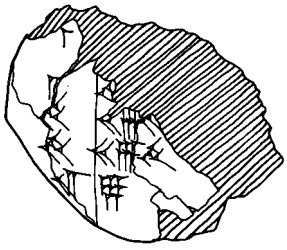


Obverse

[…]
[…] 5 30ˡ ⌜X⌝ […]
[……] 12 13 40 […]
[…]

22. Ashmolean 1924.620

Fragment of a Type IV tablet, reverse blank. Tabular calculation, in which the numerals in the right-hand column are two-thirds of the value of those in the left.

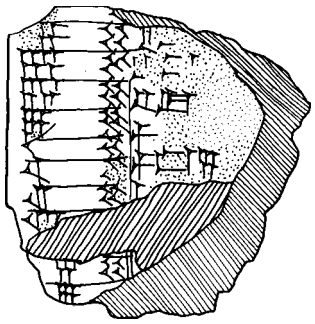


Obverse

1	[40]
1	⌜40⌝ […]
40	26 ⌜40⌝
40	26 40
12	8

23. Ashmolean 1924.564

Surface fragment from the left edge of a Type I or Type II tablet: two columns of a metrological list of weights. Numerals written in 'non-mathematical' format; ruled. 180 še ('grain') = 1 gín ('shekel') = *c.*8 grams.



	Column i		*Column ii*	
	…]			…]
1′.	[5]	⌜še⌝	1′.	1/3 [gín 15 še]
	⌜6⌝	še		1/3 ⌜gín⌝ [20 še]
	7	še		1/3 gín [25 še]
	8	še		1/2 [gín]
5′.	9	še	5′.	1/2 gín 5 [še]
	10	še		⌜1/2⌝ [gín 10 še]
	11	⌜še⌝		[…]
	12	še		
	⌜13⌝	[še]		
10′.	[14	še]		
	[1]5	še		
	[1]6	[še]		
	[…]			

Old Babylonian tablets from Kish, Mound E

Mound E: Ingharra

Mound E was the OFME's designation for the south-western corner of Tell Ingharra, ancient Hursağkalama (Figure 1). In ancient times it was often considered a separate, but subsidiary settlement to Kish, with its own religious complex dedicated in early times to the goddess Inana, and later to the goddess Ninlil. Its most prominent remains were a Neo-Babylonian temple and two associated ziggurats. The area to the west and north of that temple was excavated by Louis Watelin, Mackay's successor as the OFME's field director, in the fifth to tenth seasons of excavations. He used 'ruthless methods' to clear the area: 'No regard was plain to planning, or even photography, of the buildings encountered as the trenches went down. Objects from this area, of which there were many, were haphazardly catalogued merely by arbitrary levels.' (Moorey 1978: 89). **Tablets 24–27** come from trenches C-7, C-10, and C-11 to the northeast of the temple, excavated in the eighth and tenth seasons, 23 November 1929–18 March 1930 and 25 November 1931–18 March 1932 (Gibson 1972: 88–90; fig. 60).

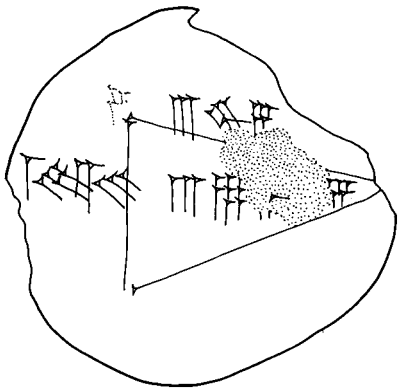
24. Ashmolean 1931.91

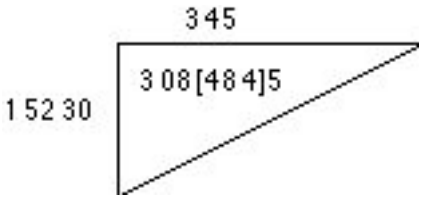
Type IV tablet, with upper right portion missing and reverse blank where preserved. Geometrical diagram of a triangle, showing the two lengths and an erroneous value for the area. Found in Trench C-10, 1 metre from surface level, 2 metres from plain level, with two other Type IV tablets bearing elementary exercises, to appear in *OECT* 15: Ashmolean 1931.92 (three personal names beginning with the element Ur-) and Ashmolean 1931.93 (lines 214–216 of the List of Trees and Wooden Objects [Ur_5-ra I]; cf. Veldhuis [1997: 156]).

The correct answer is

3;45 1;52 30 0;30 = 3;30 56 15.

The error appears to have arisen through misplacing the sexagesimal place of one part of an intermediate calculation, thus:

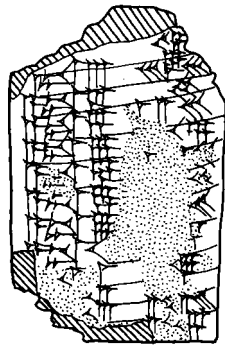


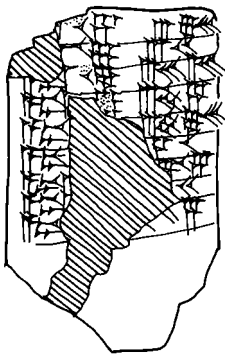


3 45		3 45	
1 52 30		1 52 30	
1 52 30		1 52 30	
7 30		7 30	
3 07 30		3 07 30	
3 45		**3 00 45**	
7 01 52 30	0;30 = 3 30 56 16	6 17 37 30	0;30 = 3 08 48 45

25. Ashmolean 1932.180

Type III tablet with upper edge missing: verbose multiplication table for 12;30. Numerals in 'mathematical' format; ruled. Found in Trench C-11 with at least 56 other tablets and fragments, of which the Old Babylonian ones are listed in Table 5 below.





Obverse

1.	[12 30 a-rá 1	12 30
	[a-rá 2]	25
	a-rá 3	37 30
	a-rá 4	50
5.	a-rá 5	1 02 30
	a-rá 6	[1] 16 (*sic*)
	a-rá 7	[1 27] ⌜30⌝
	a-rá 8	[1] ⌜40⌝
	a-rá 9	[1 52] 30
10.	a-rá 10	[2] ⌜05⌝
	[a⌝-⌜rá 11⌝	[2] 17 [30]
	[a-rá] 12	[2 30]
	[a-rá] 13	2 42 30
	[a-rá 14]	2 ⌜5⌝5

Reverse

1.	[a-rá] 15	3 07 30
	[a-rá] 16	3 20
	⌜a-rá⌝ 17	3 32 30
	a-rá ⌜18⌝	3 45
5.	a-rá ⌜19⌝	3 57 30
	a-rá [20]	4 10
	a-rá [30]	⌜6⌝ 15
	a-rá [40	8] 20
	a-rá [50]	⌜10 2⌝5

Although it is unclear whether the finds from trenches C-10 and C-11 on Mound E represent archeologically coherent assemblages, as discussed above, the contents of the tablets suggest that they might have been found together in private dwellings. If we assume that the sequence of elementary education in OB Kish was not entirely dissimilar to that identified by Veldhuis (1997) for contemporaneous Nippur, then the two Type IV tablets found in C-10 with **Tablet 24** attest the very first phases of learning. In the Nippur curricular sequence name lists like 1931.92 followed on from, and were closely related to, the Syllable Alphabet, itself the first substantive exercise after learning how to make wedge marks on the clay (Veldhuis 1997: 41–43). The List of Trees of Wooden Objects, as excerpted in Ashmolean 1931.93, was in Nippur the first and most frequently learned exercise in the second curricular phase, the thematic list of objects now known as OB Ur_5-ra (Veldhuis 1997: 46–54). Similarly, the identifiable school tablets found with **Tablet 25** in C-11 are all extracts from the Syllable Alphabet or the first two sections of OB Ur_5-ra. The letters and economic documents suggest a domestic findspot, like House F in Nippur (Robson 2001).

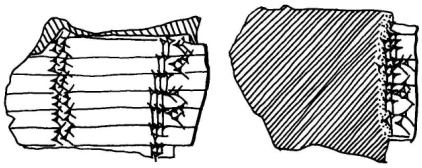
For the Neo-Babylonian finds in this trench, see **Tablet 27**, Table 7 below.

Table 5: Old Babylonian tablets from Trench C-11

Museum no.	*Description*	*Publication*
1932.156i +173	Letter; fragment 1932.156i found in Trench C-15	*OECT* 13: 209; *AbB* 10: 116
1932.175	Economic document: docket (no date)	*OECT* 13: 210
1932.176	School tablet, type III: OB Ur_5-ra I lines 18–20, 25–33	*MSL* SS1: 91
1932.177	School tablet, type I or II: OB Ur_5-ra II (urud 'bronze')	*MSL* SS1: 99
1932.179	Economic document: loan of silver from a god (date missing)	*OECT* 13: 211
1932.185	Fragment of letter	*OECT* 13: 212
1932.186p	Fragment of letter	*OECT* 13: 213
1932.187d	School tablet: unidentified fragment	*OECT* 15: 180
1932.187g	School tablet, type IV: Syllable Alphabet A 3–5	*OECT* 15: 181
1932.187i+u	School tablet, type I: Syllabary S^a 150–158, 192–198; Syllable Alphabet A 1–3, 13a–17a, 26a–29a; reverse blank	*MSL* SS1: 112
1932.187l	School tablet, type IV: unidentified	—
1932.187n	School tablet, type I: Syllabary S^a 101–6, 134–42, 180–7, 239–45	*OECT* 15: 182
1932.187r	School tablet, type I or II: unidentified fragment	*OECT* 15: 183
1932.187s	School tablet, type II: Syllable Alphabet A 1–5	*OECT* 15: 183a
1932.187w	School tablet, type I or II: Syllable Alphabet A; reverse blank	*OECT* 15: 184

26. Ashmolean 1924.1341

Right edge fragment of type III tablet: metrological table of weights. Numerals written in 'mathematical' format but 19 written as 20-lá-1. Its original range must have been 1 še–1/3 gín (*c*.34 lines). 180 še ('grain') = 1 gín ('shekel') = *c*.8 grams.



Obverse

…]
1′ [7] še 2 20
[8] še 2 40
[9] še 3
[10] še 3 20
5′ [11] še 3 40
[12] še 4
[13 še] 4 [20]
[…

Reverse

…]
1′ [53 še 1]⌜7⌝ [40]
[54 še 1]⌜8⌝
[55 še 1]⌜8⌝ 20
[56 še 1]⌜8⌝ 40
5′ [57 še] ⌜20⌝-lá-1!
[…

Mathematics in Old Babylonian Kish: conclusions

Although I warned above against making too many generalisations from the Nippur material about scribal education in other cities, the sparse evidence from Kish is nevertheless suggestive, especially when previously published tablets are also considered. De Genouillac catalogued some seventy or so mathematical and metrological tablets amongst his finds at Kish in 1911–12, including four tablets of problems and twenty-nine tables further described by Neugebauer (*PRAK*; *MKT*: see Table 6). De Genouillac's descriptions of calculations, diagrams, and metrological tablets are not sufficiently accurate to be usable here, and he made copies of none of them. There are no recorded findspots for any of the mathematical material published in *PRAK*, but from their internal characteristics they all appear to be Old Babylonian.

Including **Tablets 15–26** there is thus a total corpus of some forty-five published or partially published Old Babylonian mathematical tablets from Kish. Over half are multiplication tables, which show similar patterns of distribution across the standard Old Babylonian arithmetical series as do the Nippur tablets. In other words, the long Type I and Type II extracts (all from De Genouillac's finds) are predominantly from the first half of the series and are almost always terse. The single tables on Type III tablets, by contrast, are as expected distributed evenly across the series and are mostly verbose (**Tablets 15, 16, 20, 25**) (cf. Robson 2002 for the Nippur evidence).

Table 6: Mathematical tablets from Kish published in PRAK *and* MKT

Museum No.	PRAK	MKT	*Description*
Ist O 4849	B 458; I pl. 34	I 52 no. 111; II pl. 68	Type I arithmetical series; fragment from [reciprocals] to [24], terse;
AO 10743	C 127; II pl. 25	I 55 no. 125	Type I arithmetical series; fragment with 25, 20, terse
Ist O 3934	A 126; no copy	I 56 no. 128	Type I arithmetical series; fragment with 16;40, 15, terse
Ist O 4299 + 4654	A 485 + B 273; no copy	I 57 no. 131; II pl. 68	Type I arithmetical series; fragment with 8, 7;12, verbose
Ist O 4845	B 453; no copy	I 59 no. 139	Type I arithmetical series, tiny unidentified fragment, verbose
Ist O 3833 + 3848	A 26 + A 41; no copy	I 12 no. 28, 50 no. 106, II pl. 67	Type II (?) arithmetical series from reciprocals to 15, terse; top of obverse apparently not mathematical

Museum No.	*PRAK*	*MKT*	*Description*
Ist O 4808	B 422b; II pl. 31	I 10 no. 5	Type III table of reciprocals, verbose
Ist O 4754	B 372; no copy	I 36 no. 4	Type III multiplication table × 40, verbose
Ist O 4170	A 365; no copy	I 36 no. 6	Type III multiplication table × 36; subscript apparently 'šu hal hal' (?)
AO 10762	D 3; II pl. 29	I 36 no. 7	Type III multipliction table × 30; subscript iti […] ('Month […]')
Ist O 4438 + 4442	B 54 + B 58; I pl. 10	I 37 no. 14	Type III multiplication table × 24, verbose; subscript iti še-kin-kud ('Month XII')
Ist O 4321	A 507; no copy	I 37 no. 17	Type III multiplication table × 24, verbose
Ist O 4441	B 57; I pl. 10	I 38 no. 23	Type III multiplication table × 18, terse
Ist O 4561	B 177; no copy	I 39 no. 29	Type III multiplication table × 12, verbose
Ist O 4443	B 59; no copy	I 39 no. 38	Type III multiplication table × 8, verbose
Ist O 4144	A 339; no copy	I 40 no. 46	Type III multiplication table × 7, verbose
Ist O 4807	B 422; II pl. 31	I 40 no. 47	Type III multiplication table × 6;40, terse
AO 10768	D 9; II pl. 31	I 41 no. 49	Type III multiplication table × 6, verbose
Ist O 4533	B 149: I pl. 15	I 41 no. 54	Type III multiplication table × 4;30, verbose
Ist O 4082	A 277; no copy	I 41 no. 58	Type III multiplication table × 2;30, verbose
Ist O 4450	B 66; no copy	I 41 no. 59	Type III multiplication table × 2;30, verbose
Ist O 4134	A 329; no copy	I 68 no. 5, 70 no. 7	Type I (?) table of squares from 31 to [1 00] (?), verbose
AO 10636 + Ist O 4844	C 16 + B 452; II pl. 6	I 68 no. 1, 69 no. 1	Type III (?) table of squares from 1–20, 30, 40, 50, verbose
Ist O 4108	A 303; no copy	I 69 no. 25, 70 no. 17, 73 no. 55; II pl. 68	Metrological list or table (?) of lengths; table of inverse squares from [1] to [1 00]; table of inverse cubes from [1] to [1 00], both verbose
Ist O 4556	B 172; I pl. 16	I 69 no. 22, 73 no. 54	Table of inverse cubes from [1] to [1 00], verbose
Ist O 3816	A 9; no copy	I 77 no. 1, II pl. 42	Table of powers of 3 45 to [10th] power
Ist O 3862	A 55; no copy	I 78 no. 3, II pl. 42	Table of powers of 3 45 to [10th] power
Ist O 4583	B 199; I pl. 18	I 78 no. 4; II pl. 42	Table of powers of 3 45 to [10th] power
Ist O 3826	A 19; no copy	I 77–8 no. 3, II pl. 42	Table of powers of 9 to 10th power and [1 40] from 6th to 10th powers
Ist O 4360	A 567; no copy	I 235–6; II pl. 42	Problems: fragment of several diagrams of trapezia (sixteen extant or partially extant)
Ist O 4552	B 168; no copy	I 236–7; II pl. 42	Problems: fragment of several problems about circles, with diagrams (eight partially extant)
AO 10642	C 22; II pl. 6	I 123	Problems: fragment of several problems about triangles, with diagrams (two partially extant)
AO 10822	D 63; II pl. 53	I 123–6	Problems: damaged series of problems on brick walls, canals, and combined work rates

All known tables of squares, including **Tablet 17**, inverse squares, and inverse cubes are also verbose. There are no tables of powers amongst the Oxford tablets, which suggests that despite the fact that the previously published Kish exemplars comprise a large proportion of the known corpus of this genre of mathematical table they were not a general feature of arithmetical schooling at Kish. It may be no more than coincidence that the problem tablets (none of which were found in the Oxford excavations either) all carry multiple problems, not single ones. The two currently held in the Louvre were collated in May 2003 with the kind permission of curator Béatrice André-Salvini. A new edition of AO 10822 is in progress. The calculations and diagrams on **Tablets 18, 21, 22, and 24** all follow the layouts found on similar tablets from Nippur and Ur (most recently Robson 2002). All four are round, Type IV tablets, none square or partially square as often found in Nippur. Further, none of them were used for both calculations and other exercises as they were at Ur, nor for copying extracts of the standard mathematical lists and tables. No such tablets, nor any metrological ones, are identifiable in the *PRAK* catalogue, but this may simply reflect the limits of scholarly concern and ability in the 1920s. Christine Proust's expected new publication and study of the mathematical tablets from Kish held in Istanbul will doubtless produce much fuller and more nuanced conclusions than those provisionally presented here.

Neo-Babylonian tablet from Kish, Mound E

Tablet typology and Neo-Babylonian schooling

Petra Gesche (2001) has studied several hundred school tablets from the seventh to first centuries BCE, primarily from the northern Babylonian cities of Sippar, Borsippa, Dilbat, Kish, and Babylon itself (Gesche 2001: 36–39). She identifies two stages of scribal education, in each of which three different tablet types were used. Metrological lists, of which a dozen or so are known from Neo-Babylonian Kish (**Tablets 27, 30–41**), occur only in the first stage on the following tablet types (Gesche 2001: 44–47):

Type 1a multi-columned tablet with a long extract from a single 'canonical' lexical list (namely Syllabary S^a, Vocabularies S^b A and S^b B [*MSL* 3], the 'Weidner' god list [Cavigneaux 1981: 82–99], Tablets I–III of the thematic noun list Ur_5-ra = *ḫubullu* Hh [*MSL* 5]), running from obverse to reverse; may end with a colophon and/or a metrological list in the final column;

Type 1b obverse as Type 1a; reverse contains an extract from a 'non-canonical' list (for instance metrology, personal names, place names, professional designations, acrographic lists), a literary work, proverbs, or administrative formulae, occasionally with a colophon in the final column.

(Type 1c tablets contain standard extracts from all of the 'canonical' lists in turn and no 'non-canonical' material. Thus by definition they do not have any metrological content.)

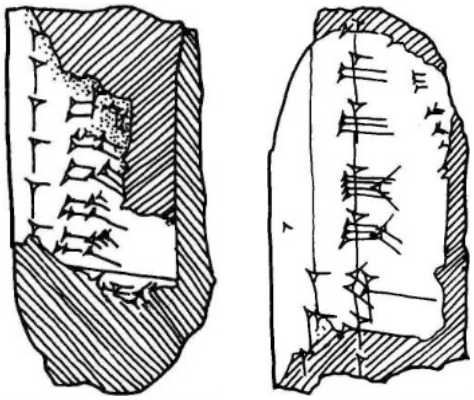
Only the extracts from the 'non-canonical' lists are translated and commented on here; the 'canonical' ones are so common that line numbers alone are given.

27. Ashmolean 1932.187h

Fragment from left edge of school tablet, type 1a or 1b: obverse Syllabary S^a 371–375 (not transliterated here), reverse metrological list (capacities). 1 PI = 6 BÁN, *c*.60 litres.

Findspot Ingharra, trench C-11 with 56 other tablets, including many Neo-Babylonian tablets (see Table 7), almost all of which carry unpublished elementary school exercises, suggesting that a school was located here.

For the Old Babylonian tablets found in this trench, see **Tablet 25**, Table 5 above.



Reverse column i′

…]
1′ ⌜1 (BÁN)⌝
2 (BÁN)
3 (BÁN)
4 (BÁN)
5′ 5 (BÁN)
1 PI
⌜1 (PI) 1 (BÁN)⌝
⌜1 (PI) 2 (BÁN)⌝
[…

Table 7: Neo-Babylonian tablets found in Trench C-11

Museum no.	*Description*	*Publication*
1932.174+ 315b+g+i	School: obverse end of S^a, start of S^b A; reverse 5 lines repeated. Returned to Baghdad	*OECT* 4: 28+48
1932.178	Economic: list of female names; no date	*OECT* 10: 352
1932.181	School: repeated ¶ BAD signs	—
1932.182	School: S^a 1–3a repeated, 2 columns each side	—
1932.183	School: obv S^a 16ff; reverse S^a 1ff repeated	—
1932.184	School: repeated ¶ BAD signs	—
1932.186a	School: S^a 176ff	—
1932.186b	School: obv S^a 108–114, rev S^a 227ff	—
1932.186c	School: Hh I 208–210	—
1932.186d	School: S^a 106–113	—
1932.186e	School: spellings	—
1932.186f	School: S^a1ff repeated	—
1932.186g	School: S^a 34ff	—
1932.186h	School: S^a 24ff, 69ff	*OECT* 4: 6
1932.186i+187q	School: S^a 349ff	—
1932.186j	School: S^a 95ff	—
1932.186k	School: S^a 1ff, 69ff, S^b A?	—
1932.186l	School: S^a 243ff, 262ff	—
1932.186m	School: S^a 1–7, 45–51, spellings	*OECT* 4: 2
1932.186n	School: S^a 28ff	—
1932.186o	School: S^b B 1ff	—
1932.186q	School: S^a 24ff, 223ff	—
1932.186r	School: spellings	—
1932.186s	School: S^a 4ff, 63ff	—
1932.186t	School: fragment of sign list	—
1932.186u	School: S^a 386–9	

Museum no.	*Description*	*Publication*
1932.186v	Economic: contract; no date	*OECT* 10: 353
1932.186w	School: S[a] 1ff	—
1932.186x	School: S[a] 137ff	—
1932.187a	School: S[b] B 132–148	*OECT* 4: 100
1932.187c	School: S[b] B 60–70, 117–127	*OECT* 4: 100
1932.187e	School: S[a] 162–174, 194–205	—
1932.187f	School: S[a] 32–35	—
1932.187j	School: unidentified	—
1932.187k	School: S[a] 345–65 repeated	—
1932.187m	School: S[a] 4ff repeated	—
1932.187p	School: S[a] 1ff repeated	—
1932.187t	School: unidentified	—
1932.187v	School: S[a] 226–235	—
1932.187x	School: S[a]. Returned to Baghdad	*OECT* 4: 33

Neo-Babylonian tablets from Kish, Mound W

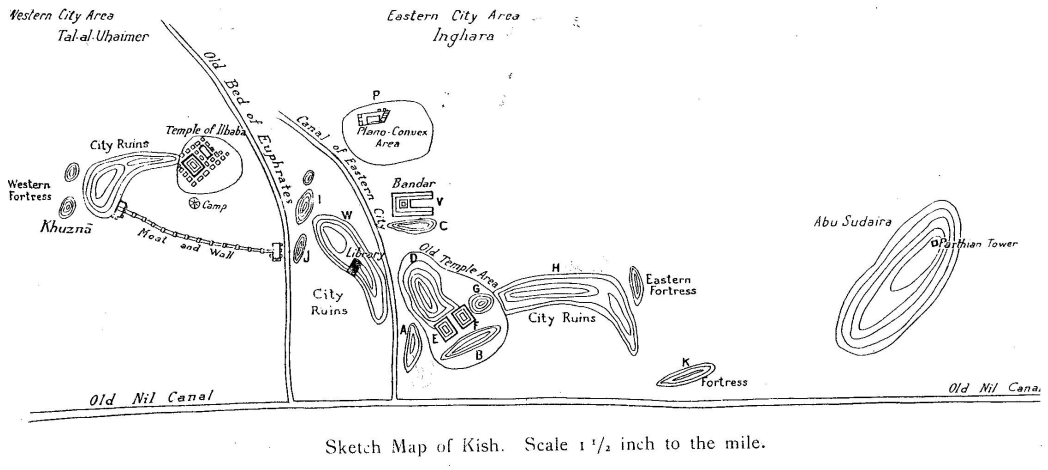
Mound W: the 'library'

Mound W, a large tell some 1 1/2 km east of Mound Z, was excavated by Stephen Langdon, Oxford's professor of Assyriology, in the final two months of the OFME's second excavation season (1 October 1923 – 20 March 1924). As over half of the expedition's cuneiform tablet finds originate from this mound 'it is … all the more to be regretted that techniques of excavation and recording were more inadequate here than anywhere else on the site. Langdon was only interested in digging out tablets and paid attention neither to their archaeological context nor to their associations' (Moorey 1978: 48), describing his work very briefly in the final report (Langdon 1924: 87–89). Fortunately Mackay's card index of objects found in that season survives; but when Langdon returned to hunt for more tablets in December–January 1925–26 he left no records at all (Moorey 1978: 49; Gibson 1972: 76–77).

Langdon describes his excavations as follows:

> On the western side of the mound marked W, I began work … a business document of the period of Nebuchadnezzar had been found by a workman on the ridge of this mound just south of its central parts. We began to find clay coffin burials at a slight depth at once, clay figurines of the mother and child, pottery of the later period and some bronze implements. After four weeks of discouraging results, I placed some jokhas [work gangs] lower down the mound, almost at plain level, and slightly further north, where we immediately came upon a rich deposit of literary tablets. As the excavation spread northward and toward the centre of the mound it became evident that we had entered a large building, whose rooms in nearly every instance contained tablets, but in shockingly bad condition (Langdon 1924: 87; pls.23, 27).

Moorey (1978: 49) notes that there are no surviving plans apart from the rough location given in his sketch plan of Kish (see Figure 2). He manages to make better sense of Langdon's discovery, thus:



Sketch Map of Kish. Scale 1 ½ inch to the mile.

Figure 2: Langdon's sketch plan of Kish showing the location of the Neo-Babylonian 'library' on Mound W (Langdon 1924: pl. 33 top)

Although Langdon's description of the stratigraphical position of his 'library' building leaves much to be desired, it is sufficient, when correlated with the objects he found, to provide the basic sequence. There were two building levels in the area he explored with about five feet of debris between the pavements of the upper and the lower, which included the so-called 'library' complex. In one of the 'library' rooms Langdon found two baked clay 'Papsukkal' figurines[8] and three small baked clay dog figurines, each inscribed. Almost every room contained tablets which had been stored in large jars, arranged round the room according to contents, primarily syllabaries and religious texts. These finds indicate that the 'library' was founded in the seventh century B.C. … Sometime in the Neo-Babylonian period the 'library' had been levelled to make way for the building whose remains lay immediately below the surface of W. The Achaemenid burials in turn cut into them suggest that they were largely disused by the fifth century B.C. (Moorey 1978: 49–50)

Although the excavators left little or no record of the 'rich deposit of library tablets' (Langdon 1924: 87) found on Mound W in 1923–24 and 1926, it is possible to identify the core of that assemblage on museological grounds. The only first-millennium library tablets in the Ashmolean collection, a group of about sixty, were accessioned in 1924, with some fragments joined to them from 1926 and early 1931 accessions. Like **Tablet 28** below, many of them are long and thin with fine, elegant handwriting and decorative firing-holes in the surface of the obverse. One of them has a colophon dated to the reign of Sargon II (721–705 BCE). While there is still much to do on the 'library', I give below (Table 8) a summary of its contents, which are broadly similary to those of the contemporaneous library in the temple of Nabû in Kalhu (Wiseman and Black 1996) and the slightly later libraries of the Šangû-Ninurta and Ekur-zākir families of Uruk (most recently Frahm 2002).

Old Babylonian **Tablets 16 and 18** were found in the lower level of the library mentioned by Moorey, quoted above.

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[8] That is, foundation deposits in the shape of a standing anthropomorphic god holding a staff and wearing long robes and a horned headdress, whose function it was to ward off malevolent spirits (Black and Green 1992: 70; 141)

Table 8: The core of the Neo-Babylonian 'library' at Kish

Composition	*Sources*
Table of squares of integers and half integers	**Tablet 28**
Metrological list of capacities	**Tablet 29**
Celestial omen series *Enūma Anu Ellil*	Solar eclipse omens: 1924.1799 (*OECT* 11: 85) Tablet 56: 1924.794+2193 (*OECT* 11: 83); Tablet 62: 1924.802 (Reiner and Pingree 1975: source B) commentary: 1924.1637+1881 (*OECT* 11: 84)
Astronomical series MUL.APIN (Hunger and Pingree 1989)	Tablet II: 1924.1815 (*OECT* 11: 86) star names, unidentified series 'tablet III': 1924.1119 (*OECT* 11: 87)
Physiognomic omina (Böck 2000)	*Šumma kittabru*: 1924.1731 (*OECT* 11: 78) fragment: 1924.1894 (*OECT* 11: 77)
Exstipicy omen series *Bārûtu*	Liver omens: 1924.1804+2056 (*OECT* 11: 82) Lung omens: 1924.793+1412+1507+1817+2043 (+) 1824+1829 (*OECT* 11: 79, 80)
The Epic of Creation *Enūma eliš* (Dalley 2000: 228–77)	Tablet I: 1924.790+1813+2081 (*OECT* 6, pl. 31-35) Tablet III: 1926.375 (*OECT* 6: pl. 37) Tablet IV: 1924.1828+1926.373+374 (*OECT* 6: pl. 36-37) Unidentified fragment: 1924.2055 (*OECT* 11: 53)
Other literature	Letter or prophecy: 1924.1541+1827 (*OECT* 11: 95) Bilingual *eduba* composition: 1924.842+1926.376 (Sjöberg 1972) Unidentified literary fragment: 1924.1539 (*OECT* 11: 60)
Incantation series *Šurpu* (Reiner 1958)	Tablet II: 1924.1826 (+) 2054 (*OECT* 11: 36, 37) Tablet III: 1924.865 (*OECT* 11: 38) Tablet IV–V: 1924.809 (*OECT* 11: 38), 1924.1808 (*OECT* 11: 39) Tablet VIII: 1924.2042 (*OECT* 11: 41) Tablet IX: 1924.2040 (*OECT* 11: 42), 1924.845m+1349+2049 (*OECT* 11: 43)
Incantations and rituals	*Bīt rimki*, Third house: 1924.1809 (*OECT* 11: 33) *Lamaštu*: 1924.900 (*OECT* 11: 57) LUGAL NAM.TAR: 1924.1215 (*OECT* 11: 34) SAG.BA SAG.BA: 1924.1429+1811 (*OECT* 11: 27), 1924.1440+1814 (*OECT* 11: 26) SAG.GIG.GA: 1924.874+2046 (*OECT* 11: 29) *Utukku lemnūtu*: 1924.805 (*OECT* 11: 25), 1924.1354 (*OECT* 11: 24) ZI.PÀ: 1924.1364 (Borger 1969: 22), 1924.1759 (*OECT* 11: 61) In Akkadian: 1924.1362 (*OECT* 11: 62), 1924.1474 (*OECT* 11: 10) In Sumerian: 1924.2041 (*OECT* 11: 12) Bilingual: 1924.1534+1535 (*OECT* 11: 35) Unidentified: 1924.1810 (*OECT* 11: 65), 1924.1669 (*OECT* 11: 67)
Medical incantations and rituals	*Maqlû* Tablet III: 1924.841+1288 (+) 1816+2035 (*OECT* 11: 45, 44) Tablet V?: 1924.2037 (*OECT* 11: 46) UGU: 1924.0788+2077 (*OECT* 11: 71) Unidentified: 1924.1338 (*OECT* 11: 75), 1924.1819 (+) 1821 (+) 2047 (*OECT* 11: 72, 73, 74)

Composition	*Sources*
Prayers	*Eršaḫunga* to Enlil: 1924.853 (+) 2038 (*OECT* 11: 16, 17) To Marduk: 1924.1420 (*OECT* 11: 49), 1924.1820 (*OECT* 11: 52) To Shamash: 1924.2399 (*OECT* 11: 94) Unidentified: 1924.1566+1812+2254+2259 (+) 1430 (*OECT* 11: 63, 64)
Public ritual of Babylon	1924.1792+1806+1818 (*OECT* 11: 47)
Cultic calendar	1924.789+1495+1553+1797+1802 (+) 2053 (*OECT* 11: 69+70)
List of gods *An* = *Anum* (Litke 1998)	Tablet II: 1924.855+902+960+1366+1376+1518+1800+1801 +2034+2278 (unpublished)
Sacred topographical series *Tintir* = *Babylon* (George 1992)	Tablet I: 1924.849 Tablet II: 1924.810 Tablet IV: 1924.849 Tablet V: 1924.807+1415+1501+1830+2044+2057
Unidentified fragments	1924.2039 (+) 2064 (*OECT* 11: 18+20); 1924.2058 (*OECT* 11: 8)

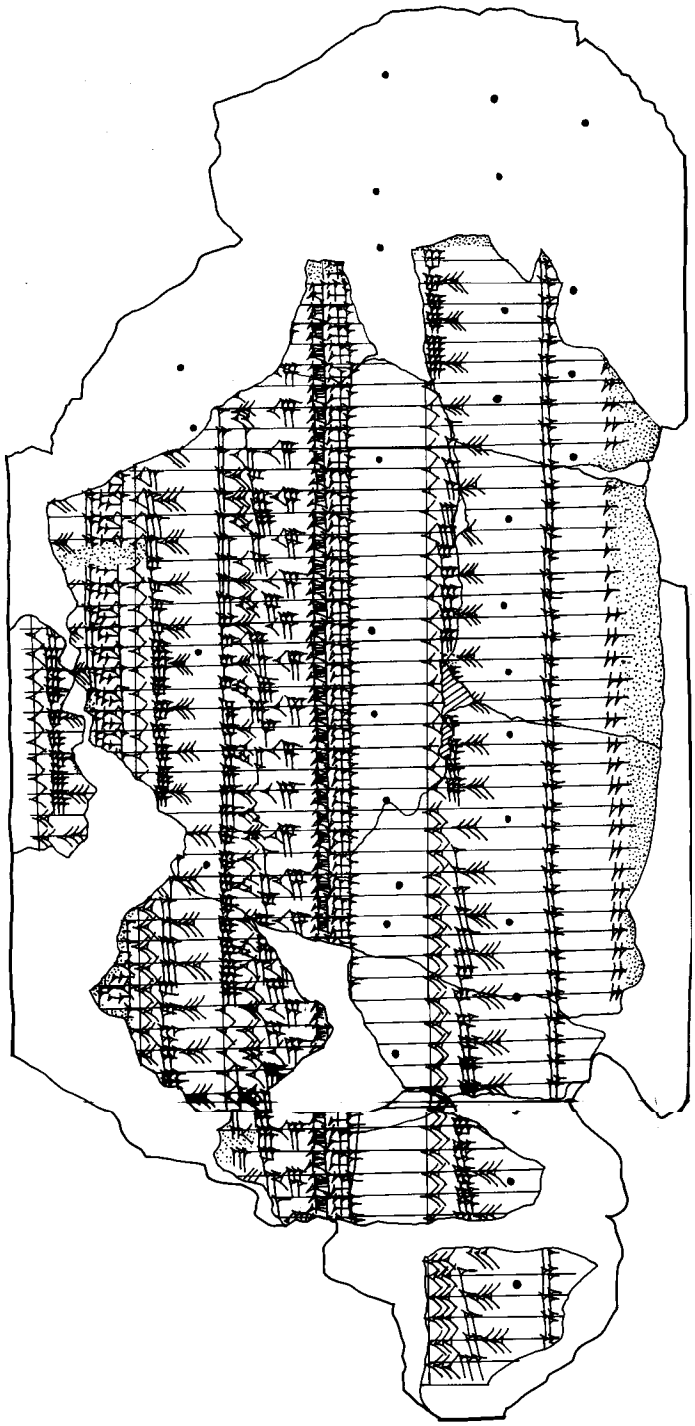
Catalogued amongst the Neo-Babylonian scholarly tablets, with museum numbers concentrated in the range 1924.800–2000, and thus probably emanating from the same library building in Kish, are many hundreds of fragmentary school tablets bearing multiple exercises (see the introductory section on Neo-Babylonian schooling above **Tablet 27**). About a hundred and fifty of them, published in *Iraq* 6, *MSL* SS1, and *OECT* 11, have been catalogued by Gesche (2001: 781–8) but many more remain unedited. The corpus would repay further publication and investigation.

Only a dozen or so of those hundred and fifty tablets — **Tablets 30–41** — bear metrological lists (of capacities, weights, or lengths), and none carry arithmetical tables. Strikingly, the lists are almost all found of the back of so-called Type 1b tablets (where the type can be identified), in conjunction with what Gesche (2001: 81–152) has called 'non-canonical' exercises. While the obverses of these tablets contain long extracts from one of four widely copied, highly standardised exercises, the 'non-canonical' ones — in this case especially lists of male or female personal names and variant spellings of verbal forms — apparently have no fixed content or order but were written according to the whim of the teacher or student.

28. Ashmolean 1924.796+

Large library tablet with 32 decorative 'firing holes' extant: table of squares and inverse squares of integers and half-integers from [1] to 60, with entries of the form *n* A.RÁ *n* n^2 SI_8.E *n*.ÀM '*n* times *n* is n^2; its square-side is *n*'. Empty internal sexagesimal places are marked by a sign (transliterated here with a colon) which is indistinguishable from the sign '30', rather than the expected two vertically aligned Winkelhakens. This is the earliest attested use of an intermediate zero sign in Babylonia.[9] A damaged colophon gives the name of the scribe, one Bēl-bān-apli (*MKT*: I 73; Hunger 1968: 185).

[9] As Høyrup (2002: 15–16 n19) points out, two late Old Babylonian mathematical tablets from Susa in southwest Iran use a similar sign to indicate *either* missing tens *or* missing units, but not both together (Bruins and Rutten 1961: TMS 12, TMS 14).

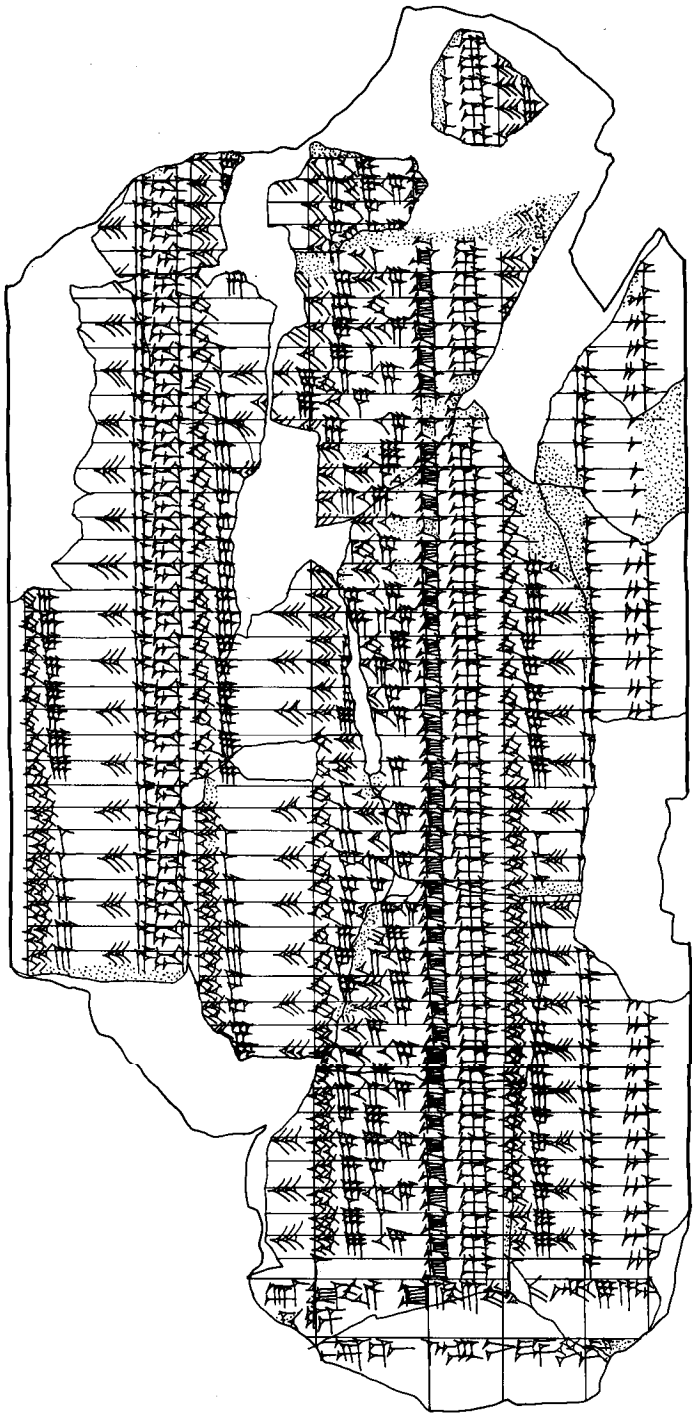


Obverse

1.	[1 A.RÁ 1	1	SI_8.E	1.ÀM]
	[1 30 A.RÁ 1 30	2 15	SI_8.E	1 30.ÀM]
	[2 A.RÁ 2	4	SI_8.E	2.ÀM]
	[2 30 A.RÁ 2 30	6 15	SI_8.E	2 30.ÀM]
5.	[3 A.RÁ 3	9	SI_8.E	3.ÀM]
	[3 30 A.RÁ 3 30	12 15	SI_8.E	3 30.ÀM]
	[4 A.RÁ 4	16	SI_8.E	4.ÀM]

	[4 30 A.RÁ 4 30	20 15	SI_8.E	4 30.ÀM]
	[5 A.RÁ 5	25	SI_8.E	5.ÀM]
10.	[5 30 A.RÁ 5 30	30 15	SI_8.E	5 30.ÀM]
	[6 A.RÁ 6	36	SI_8.E	6.ÀM]
	[6 30 A.RÁ 6 30	42 15	SI_8.E	6 30.ÀM]
	[7 A.RÁ 7	49	SI_8].⌜E⌝	7.⌜ÀM⌝
	[7 30 A.RÁ 7 30	56 15]	SI_8.E	7 30.⌜ÀM⌝
15.	8 A.RÁ 8	1 04]	SI_8.E	8.⌜ÀM⌝
	[8 30 A.RÁ 8 30	1 12] ⌜15⌝	SI_8.E	8 30.⌜ÀM⌝
	[9 A.RÁ 9	1 21]	SI_8.E	9.⌜ÀM⌝
	[9 30 A.RÁ 9 30	1 30] 15	SI_8.E	9 30.⌜ÀM⌝
	[10 A.RÁ 10	1] ⌜40⌝	SI_8.E	10.⌜ÀM⌝
20.	[10 30 A.RÁ 10 30]	1 50 15	SI_8.E	10 30.⌜ÀM⌝
	[11 A.RÁ 11]	2 01	SI_8.E	11.⌜ÀM⌝
	[11 30 A.RÁ 11] ⌜30⌝	2 12 15	SI_8.E	11 30.⌜ÀM⌝
	[12 A].⌜RÁ⌝ 12	2 24	SI_8.E	12.⌜ÀM⌝
	[12] ⌜30⌝ A.RÁ 12 30	2 36 15	SI_8.E	12 30.⌜ÀM⌝
25.	[13] A.RÁ 13	2 49	SI_8.E	13.⌜ÀM⌝
	[13] 30 ⌜A.RÁ⌝ 13 30	3 02 15	SI_8.E	13 30.⌜ÀM⌝
	[14] ⌜A.RÁ⌝ 14	3 16	SI_8.E	14.⌜ÀM⌝
	[14] ⌜30⌝ A.RÁ 14 30	3 30 15	SI_8.E	14 30.⌜ÀM⌝
	[15] A.RÁ 15	3 45	SI_8.E	15.⌜ÀM⌝
30.	⌜15⌝ 30 A.RÁ 15 30	4 : 15	SI_8.E	15 30.⌜ÀM⌝
	16 A.RÁ 16	4 16	SI_8.E	16.⌜ÀM⌝
	16 30 A.RÁ 16 30	4 32 15	SI_8.E	⌜16⌝ 30.⌜ÀM⌝
	17 A.RÁ 17	4 49	SI_8.E	⌜17.ÀM⌝
	17 30 A.RÁ 17 30	5! 06 15	SI_8.E	⌜17⌝ 30.⌜ÀM⌝
35.	18 ⌜A⌝.RÁ 18	5 24	SI_8.E	⌜18.ÀM⌝
	18 ⌜30⌝ [A].⌜RÁ⌝ 18 30	5 42 15	SI_8.E	⌜18⌝ 30.⌜ÀM⌝
	19 [A.RÁ] 19	6 01	SI_8.E	19.⌜ÀM⌝
	19 30 [A.RÁ 1]9 30	6 20 15	SI_8.E	19 30.⌜ÀM⌝
	20 [A.RÁ 20]	6 40	SI_8.E	20.⌜ÀM⌝
40.	20 30 [A.RÁ 20] 30	7 «50» 15	SI_8.E	20 30.⌜ÀM⌝
	[21 A.RÁ 2]1	7 21	SI_8.E	21.⌜ÀM⌝
	[21 30 A.RÁ] ⌜21⌝ 30	7 42 15	SI_8.E	21 30.⌜ÀM⌝
	[22 A.RÁ] 22	8 04	SI_8.E	22.⌜ÀM⌝
	[22 30 A].⌜RÁ⌝ 22 30	8 ⌜26⌝ 15	SI_8.E	22 30.⌜ÀM⌝
45.	[23 A].⌜RÁ⌝ 23	8 4⌜9⌝	⌜SI_8.E⌝	23.⌜ÀM⌝
	[23 30] ⌜A.RÁ⌝ 23 30	9 12 1⌜5⌝	[SI_8].⌜E⌝	23 30.⌜ÀM⌝
	[24] ⌜A⌝.RÁ 24	9 3!6	[SI_8].⌜E⌝	24.⌜ÀM⌝
	[24 30 A].⌜RÁ⌝ 24 30	10 : 15	⌜SI_8⌝.[E]	24 30.⌜ÀM⌝
	[25 A.RÁ] 25	10 25	SI_8.[E]	25.⌜ÀM⌝
50.	[25 30 A.RÁ] 25 30	10 50 15	⌜SI_8⌝.[E]	25 30.⌜ÀM⌝
	[26 A.RÁ 2]6	11 16	[SI_8.E]	26.⌜ÀM⌝
	[26 30 A.RÁ 26] 30	11 42 [15	SI_8.E]	⌜26 30.ÀM⌝
	[27 A.RÁ 27	1]2 09	⌜SI_8.E⌝	⌜27⌝.[ÀM]
	[27 30 A.RÁ 27 30	1]⌜2 3⌝6 15	SI_8.E	27 ⌜30⌝.[ÀM]
55.	[28 A.RÁ 28	1]3 04	SI_8.E	28.[ÀM]
	[28 30 A.RÁ 28 30	13] 32 15	SI_8.E	28 30.[ÀM]
	[29 A.RÁ 29	14] 01	SI_8.E	29.[ÀM]
	[29 30 A.RÁ 29 30	14 30] ⌜15	SI_8.E	29 30⌝.[ÀM]
	[30 A.RÁ 30	15	SI_8.E	30.ÀM]
60.	[30 30 A.RÁ 30 30	15 30 15	SI_8.E]	30 30.⌜ÀM⌝
	[31 A.RÁ 31	16 01	SI_8.E]	31.⌜ÀM⌝

	[31 30 A.RÁ 31 30	16 32 15	SI_8.E]	31 30.⌜ÀM⌝
	[32 A.RÁ 32	17 04	SI_8.E]	32.⌜ÀM⌝
	[32 30 A.RÁ 32 30	17 36 15	SI_8.E]	32 30.⌜ÀM⌝
65.	[33 A.RÁ 33	18 09	SI_8.E]	33.[ÀM]



Reverse

1.	[33 30 A.RÁ 33 30	18 42 15	SI_8.E	33 30.ÀM]
	[34 A.RÁ 34	19 16	SI_8.E	34.ÀM]

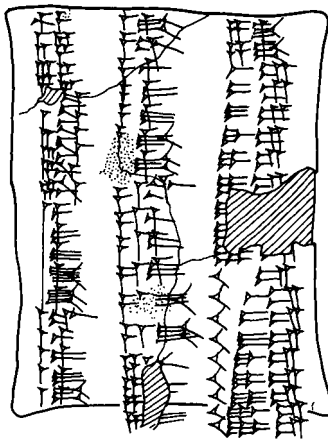
	[34 30 A.RÁ 34 30	19 50 15	SI_8].⌜E⌝	[34 30.ÀM]
	[35 A.RÁ 35	20 25]	⌜SI_8⌝.E	3[5.ÀM]
5.	[35 30 A.RÁ 35 30	21 : 15]	⌜SI_8⌝.E	3⌜5⌝ [30.ÀM]
	[36 A.RÁ 36	21 36]	⌜SI_8.E	36.[ÀM]
	[36 30 A.RÁ 36 30	22 12 15]	⌜SI_8.E	3⌝[6 30.ÀM]
	[37 A.RÁ] ⌜37⌝	22 ⌜49	SI_8⌝.[E	37.ÀM]
	[37 30] A.RÁ 3⌜7 30⌝	23 2¦6¦ 15	⌜SI_8⌝.[E	37 30.ÀM]
10.	[38] A.RÁ 3[8]	24 «1»4	⌜SI_8⌝.[E	38.ÀM]
	[38] 30 A.RÁ 3[8 30]	24 ⌜42 15⌝	[SI_8.E	38 30.ÀM]
	[39] A.RÁ 3[9]	⌜25⌝ 21	SI_8.E	⌜39⌝.[ÀM]
	[39] 30 A.RÁ ⌜39 30⌝	⌜2⌝6 : 15	SI_8.E	⌜39⌝ [30.ÀM]
	[40] A.RÁ 40	26 40	SI_8.E	⌜40.ÀM⌝
15.	⌜40⌝ 30 A.RÁ 40 ⌜30⌝	27 20 15	SI_8.E	[40 30].⌜ÀM⌝
	[41] A.RÁ 41	28¦ 01	SI_8.E	[41].⌜ÀM⌝
	[41] 30 A.RÁ 4¦1 30	28 42 15	SI_8.⌜E⌝	[41 30].ÀM
	[42] A.RÁ 42	29 24	⌜SI_8.E⌝	[42].ÀM
	[42] 30 A.RÁ 42 30	⌜30 : 06⌝ 15	⌜SI_8.E⌝	[42 30].⌜ÀM⌝
20.	[43] A.RÁ 43	30 ⌜4⌝9	SI_8.E	[43].⌜ÀM⌝
	[43] 30 A.RÁ 43 30	31 32¦ [15]	SI_8.E	⌜4⌝[3 30].⌜ÀM⌝
	[44] A.RÁ 44	32¦ 16	SI_8.E	⌜44.ÀM⌝
	[44] 30 A.RÁ 44 [30]	⌜33⌝ : ⌜15⌝	⌜SI_8⌝.E	4[4 30].⌜ÀM⌝
	[45] A.RÁ 45	[3]⌜3⌝ 45	SI_8.E	4[5].⌜ÀM⌝
25.	[45] 30 A.RÁ 45 [30]	⌜34⌝ 30 [15]	SI_8.E	45 ⌜30.ÀM⌝
	⌜46⌝ A.RÁ 46	35 16¦	SI_8.E	46.⌜ÀM⌝
	46 30 A.RÁ 46 30	36 02 15	SI_8.E	46 30.⌜ÀM⌝
	47 A.RÁ 47	3⌜6⌝ 49	SI_8.E	47.ÀM
	47 30 A.RÁ 47 30	3⌜7 3⌝6 15	SI_8.E	47 30.ÀM
30.	48 A.RÁ 48	3⌜8 2⌝4	SI_8.E	48.ÀM
	48 30 A.RÁ 48 30	39 [12] 15	SI_8.E	48 30.ÀM
	49 A.RÁ 49	40 : [01]	SI_8.E	49.⌜ÀM⌝
	49 30 A.RÁ 49 [30]	⌜40⌝ 50 ⌜1⌝5	SI_8.E	49 30.⌜ÀM⌝
	50 A.RÁ [50]	41 ⌜40⌝	SI_8.E	50.⌜ÀM⌝
35.	50 30 A.RÁ 50 30	42 30 15	SI_8.E	50 30.⌜ÀM⌝
	51 A.RÁ 51	43 21	SI_8.E	51.⌜ÀM⌝
	51 30 A.RÁ 51 30	44 12 15	SI_8.E	51 30.⌜ÀM⌝
	52 A.RÁ 52	45 04	SI_8.E	⌜52⌝.[ÀM]
	52 30 A.RÁ 52 30	45 ⌜5⌝6 15	SI_8.E	52 30.[ÀM]
40.	53 A.RÁ 53	46 ⌜4⌝9	SI_8.E	53.[ÀM]
	53 30 A.RÁ 53 30	47 ⌜4⌝2 15	SI_8.E	53 30.⌜ÀM⌝
	[54 A.RÁ] 54	48 36	SI_8.E	54.⌜ÀM⌝
	[54 30 A.RÁ] 54 30	4⌜9 30⌝ 15	SI_8.E	54 30.⌜ÀM⌝
	[55 A.RÁ] ⌜5⌝5	50 25	SI_8.E	55.ÀM
45.	[55 30 A.RÁ 5]⌜5 30⌝	51 20 15	SI_8.E	55 30.ÀM
	[56 A.RÁ 56]	52 16	SI_8.E	56.ÀM
	[56 30 A.RÁ 56 30]	53 12 15	SI_8.E	56 30.ÀM
	[57 A.RÁ 57]	54 09	SI_8.E	57.ÀM
	[57 30 A.RÁ 57] 30	55 06 15	SI_8.E	57 30.ÀM
50.	[58 A.RÁ 58]	56 04	SI_8.E	58.ÀM
	[58 30 A.RÁ 58] 30	57 «1»2 15	SI_8.E	58 30.ÀM
	[59 A.RÁ 59]	58¦ 01	SI_8.E	59.ÀM
	[59 30 A.RÁ 59] 30	59 ‹:› 15	SI_8.E	59 30.ÀM
	[1 A.RÁ 1]	1	SI_8.E	1.ÀM

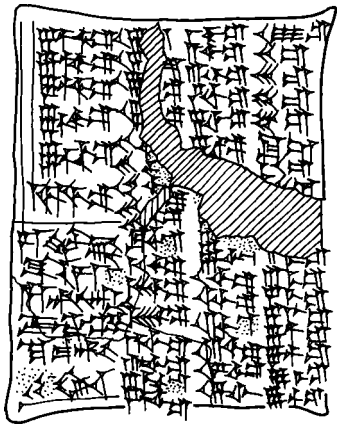
55. [……] IKU KI$^{?}$ HI.A KI A.ŠÀ X X EN 18 A.ŠÀ] [……]
[……] X AL.[TIL]
[……] *ṭup-pi* ^{md}EN.DÙ.DUMU LÚ X [……]

‘[……] iku …… area …… 18 times [……]
[……] … finished
[……] Tablet of Bēl-b n-apli, man … [……]’

29. Ashmolean 1924.1278

Small, almost square tablet with three columns on the obverse, four on the reverse: metrological list of capacities, with colophon giving the name and family of the scribe. 10 NINDA = 1 SILÀ, 6 SILA = 1 BÁN, 6 BÁN = 1 PI, 5 PI = 1 GUR, *c.*180 litres. Presumably from the same library as **Tablet 28**.





	Obverse column i	*Obverse column ii*	*Obverse column iii*
1.	1/2 ⌜NINDA⌝	1 (PI) 5 (BÁN)	4 (PI) 4 (BÁN)
	1 NINDA	2 PI	4 (PI) 5 (BÁN)
	2 NINDA	2 (PI) 1 (BÁN)	1 GUR
	3 NINDA	2 (PI) 2 (BÁN)	2 GUR
5.	4 NINDA	2 (PI) 3 (BÁN)	3 GUR
	[1/2] SILÀ	2 (PI) 4 (BÁN)	4 GUR
	1 SILÀ	[2 (PI)] 5 (BÁN)	5 GUR
	2 SILÀ	3 PI	⌜6 GUR⌝
	3 SILÀ	3 (PI) 1 (BÁN)	⌜7⌝ [GUR]
10.	4 SILÀ	3 (PI) 2 (BÁN)	⌜8⌝ [GUR]
	5 SILÀ	3 (PI) 3 (BÁN)	⌜9 GUR⌝
	1 (BÁN)	3 (PI) ⌜4 (BÁN)⌝	10 GUR
	2 (BÁN)	3 (PI) 5 (BÁN)	11 GUR
	3 (BÁN)	4 ⌜PI⌝	12 GUR
15.	4 (BÁN)	4 (PI) ⌜1 (BÁN)⌝	13 GUR
	5 (BÁN)	4 (PI) ⌜2 (BÁN)⌝	14 GUR
	1 PI	4 (PI) ⌜3 (BÁN)⌝	15 GUR
	1 (PI) 1 (BÁN)		16 GUR
	1 (PI) 2 (BÁN)		17 GUR
20.	1 (PI) 3 (BÁN)		18 GUR
	1 (PI) 4! (BÁN)		

Reverse column iv	*Reverse column iii*	*Reverse column ii*	*Reverse column i*	
5 ME LIM GUR	⌜16⌝ [LIM] ⌜GUR⌝	1 LIM GUR	19 GUR	1.
6 ME LIM GUR	17! [LIM] GUR	2 LIM GUR	20 GUR	
7 ME LIM GUR	18 [LIM] GUR	3 LIM GUR	30 GUR	
8 ME LIM GUR	19 [LIM] GUR	4 LIM GUR	40 GUR	
9 ME LIM GUR	20 ⌜LIM⌝ [GUR]	5 LIM GUR	50 GUR	5.
1 LIM LIM GUR	30 ⌜LIM⌝ [GUR]	⌜6 LIM⌝ GUR	1+ŠU GUR	
————————	40 LIM GUR	[7 LIM GUR]	1 10 GUR	
ŠÁ ^{m}UG.GA	50 ⌜LIM⌝ GUR	⌜8⌝ [LIM GUR]	⌜1 20 GUR⌝	
DUMU.ŠÚ ŠÁ ^{m}	ŠU LIM GUR	9 LIM ⌜GUR⌝	[1 30 GUR]	
A ^{md}U.PAP.DINGIR.MEŠ	1 10 LIM GUR	10 LIM GUR	⌜2 ME GUR⌝	10.
DUMU LA LA ^{d}AG	1 20 LIM GUR	11 LIM GUR	3 ME GUR	
X MA BAL	1 30 LIM GUR	12 LIM ⌜GUR⌝	4 ME GUR	
⌜LÚ⌝ KIŠ^{ki}!	1 ME LIM GUR	13 LIM GUR	5 ME GUR	
	2 ME LIM GUR	14 LIM GUR	6 ME! GUR	
	3 ME LIM ⌜GUR⌝	15 LIM ‹GUR›	7 ME! GUR	15.
	4 ME LIM GUR		8 ME GUR	
			9 ME! GUR	

This tiny tablet shows some interesting features, particularly in the sequence of gur measures. First, the scribe has written the horizontal unit numerals associated with the GUR measure, in grouping them vertically in groups of three thus: ≡, instead of horizontally: – – –, in the Old Babylonian style (compare **Tablet 19**). Six GUR, for instance, is written here as ≡ ≡ GUR, not = = = GUR as previously. **Tablet 40** follows the same writing convention. Second, as was common in the first millennium, the scribe has used mixed decimal-sexagesimal notation, writing 1+ŠU for *šuššu* 'sixty' then reverting to standard sexagesimal notation for values between 61 and 99. From a hundred upwards he has used the logograms ME for *me'atu* 'hundred' and LIM for *līmu* 'thousand', where 1 ME LIM represents a hundred thousand and 1 LIM LIM a thousand thousand, or one million — the final entry in the table.

A useful contemporary parallel is VAT 9840+, a metrological list of capacities and weights from seventh-century Aššur (*KAV*: 184; Friberg 1993: text 1). The capacity list starts at 1 SILÀ and runs to at least 7 ME LIM ANŠE (the Assyrian equivalent of the GUR) — at which point the tablet is broken. The fact that **Tablet 29** stops at 1 LIM LIM GUR strengthens Friberg's suggestion that the endpoint of VAT 9840+ must have been 1 LIM LIM ANŠE (Friberg 1993: 388). The Assyrian list, however, groups the ANŠE (GUR) signs in groups of two horizontal wedges, so that 3, for instance, is written = –.

The colophon of **Tablet 29** reads in translation, '(Tablet) of Mr Ugga (?), son of (erasure), son of Adad-kabti-ilāni, …… of Nabû, ……, man of Kish.'

30. Ashmolean 1924.1048

Fragment of school tablet, type 1a or 1b, returned to Baghdad. Drawing (*OECT* 4: 127) of reverse only: other side missing or blank? Column i: Vocabulary S^{b} A 271–274 (not transliterated here); column ii: metrological list (capacities). The errors in lines 4 and 5 may be the ancient scribe's or the twentieth-century scholar's.

Column ii

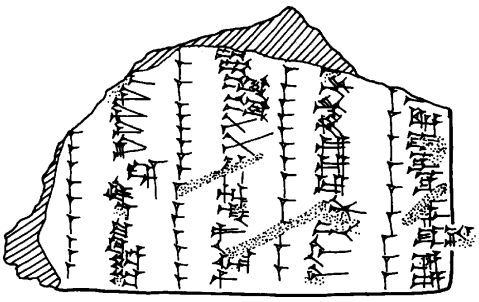
…]
1′. ⌜3⌝ (PI) 5 (BÁN)
4 PI
4 (PI) 1 (BÁN)
5 (*sic*; for 4) (PI) 2 (BÁN)
5′. 6 (*sic*; for 4) (PI) 3 (BÁN)
⌜4 (PI)⌝ 4 (BÁN)
4 (PI) 5 (BÁN)

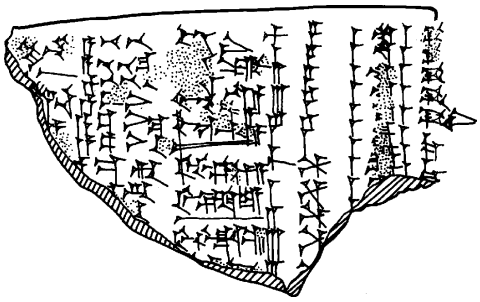
---

1 GUR
⌜2⌝ GUR
10′. [3] GUR
[4] GUR
[…

31. Ashmolean 1924.1217

Fragment from lower right corner of school tablet, type 1b: obverse Syllabary S[a] 193–204, 241–254, 292–302, 334–343; reverse columns i–ii Syllabary S[a] 344–350, 376–84 (not transliterated here), column iii metrological list (capacities), column iv pairs of women's names, column v spellings, column vi unclear.



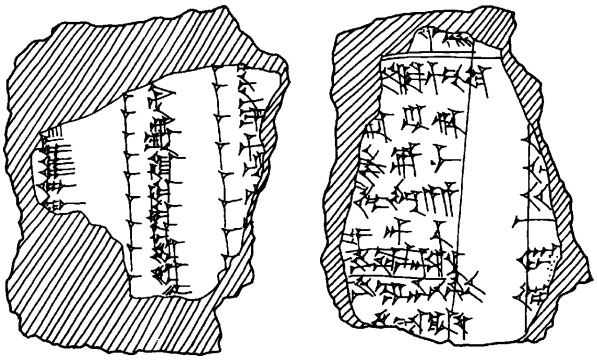


Reverse column vi	*Column v*	*Column iv*	*Column iii*	
[…] X MU	*a-baṭ-ṭíl*	^{f}*be-lí*	1/2 NINDA	1.
[…] AŠ	*a-baṭ-ṭíl-ma*	[^{f}]⌜*be*⌝-*lí-ia* «X»	1 NINDA	
[…⌝ X NA	*a-baṭ-ṭil-*⌜*šú*⌝	[^{f}]⌜*na*⌝-*na-a*	2 NINDA	
[…] ⌜A⌝	*a-*⌜*ḫap*⌝*-pap*	^{f}*na*$^{?}$-*na*$^{?}$-*a*	3 NINDA	
[…ḫap-pap-ma	^{f} ⌜^{d} X X⌝ a	4 NINDA	5.
a-ḫap-pap-šú	———	1/2 SILÀ	
a-ḫad-dal	^{f}NIN-IM$^{?}$-A	1 SILÀ	
[*a*]-⌜*ḫad*⌝*-dal-*‹*ma*›	^{f}E-DI-IA	2 SILÀ	
[*a-ḫad*]-⌜*dal*⌝-‹*šú*›	———	3 SILÀ	
[…ḫad-dal-‹ma›	^{f}NIN-ŠÚ-X-A	⌜4 SILÀ⌝	10.
[…ḫad-dal-‹šú›	(traces)	[…ḫad-dal-‹šú›	
[…ḫad-dal-‹it›	[…xz	[…ḫad-dal-‹it›	

The personal names in column iv are very clumsily written, making them almost impossible to read; none can be identified with those given by Gesche (2001: 99–102) in her list of female personal names in Late Babylonian school exercises. The verbal forms in column v read, 'I abandon, I abandon and, I abandon it, I smash, I smash and, I smash it, I knot, I knot ‹and›, I knot ‹it›' (cf. Gesche 2001: 115 *bṭl*, 116 *ḫpp*).

32. Ashmolean 1924.1477

Fragment from centre of school tablet, type 1b: obverse Syllabary S[a] 150–156, 196–205, 245–250 (not transliterated here); reverse column i′ metrological list?, column ii′ personal names.



Reverse column ii′	*Column i′*
…]	…]
[……] ⌜ŠEŠ?⌝	10? […
———————	10? […
[m] ⌜TA⌝ DI MAŠ BI DI	20? […
[m] ⌜UŠ?⌝ RI? RI	———
[m] *X-kal-bar*	18? […
[m] *mi-ṣir-a-a*	19? […
[m] ⌜*nur*⌝-AN-*šú*	[…
[m] LÚ SAG AN NIM ŠÚ	
[…] LÚ X X BE ŠEŠ	
[…] ⌜LÚ⌝ TA IŠ LIŠ	
[…	

The name Miṣiraya is later attested as the ancestor of a family of Babylonian scribes (Hunger 1968: 412, 416, 419); the one below it is probably Nūr-ilišu. The other personal names listed here are very difficult to interpret.

33. Ashmolean 1924.1520 + 1924.1529

Fragment from upper right corner of school tablet, type 1a or 1b: obverse erased (Syllabary S[a]?); reverse column i Syllabary S[a] 150–161 (not transliterated here) column ii metrological list (capacities), column iii traces.

Reverse column ii

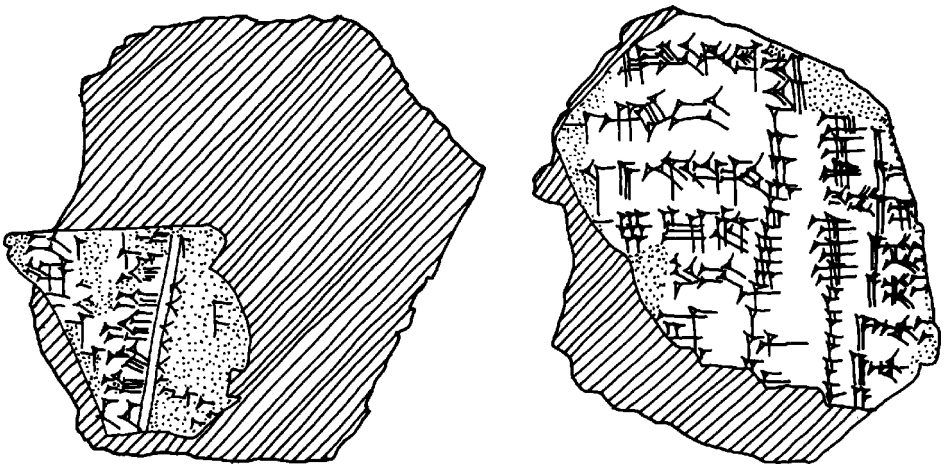
1. 1 (BÁN)
   2 (BÁN)
   3 (BÁN)
   ⌜4 (BÁN)⌝
5. 5 (BÁN)
   [1] PI
   1 (PI) 1 (BÁN)
   1 (PI) 2 (BÁN)
   1 (PI) 3 (BÁN)
10. [1 (PI)] 4 (BÁN)
    1 (PI) 5 (BÁN)
    [2] PI
    [2 (PI)] 1 (BÁN)
    […

34. Ashmolean 1924.1098+1389

Fragment of school tablet, type 1b, returned to Baghdad. Drawing (*OECT* 4: 75) of obverse of fragment 1924.1098 only (= Vocabulary S[b] A 87–99); card catalogue records the following contents: obverse Vocabulary S[b] A 87–99, 115–122, reverse metrological list (capacities: SILÀ) and spellings *a-mur*-x. Turns horizontally.

35. Ashmolean 1924.1450

Fragment from centre of school tablet, type 1b: obverse lexical list Hh I 36–42, 88ff (not transliterated here); reverse column i′ spellings, column ii′ metrological list (lengths), column iii′ model contract. 24 ŠU.SI (‘finger’) = 1 KÙŠ (‘cubit’); 14 KÙŠ = 1 NINDA (‘rod’), *c*.6 m.

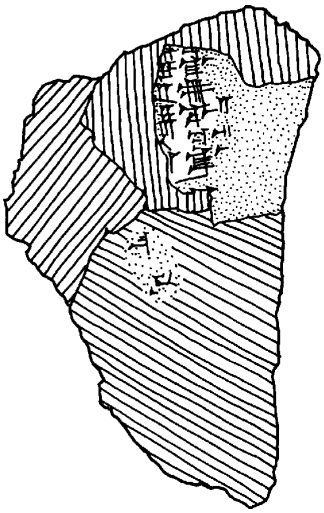


Reverse column iii’	*Column ii’*	*Column i’*	
…]	…]	…]	
[… ^{d}]AK-ŠEŠ.MEŠ-DÍM	22 [ŠU.SI]	*a*-[……]	1′.
[… DUMU] ⌜*e*⌝-*gi-bi*	23 [ŠU.SI]	*a*-⌜*mar*$^{?}$⌝-[*raṭ*]	
[…] X *a-na muḫ-ḫi*	1 KÙŠ	*a*-⌜*mar*⌝-[*raṭ-ma*]	
[……] 8 GÍN ŠÀ	2 KÙŠ	*a-qab*-⌜*bi*⌝	
[……] LÚ.BI	3 KÙŠ	*a-qab*-⌜*bi*⌝-[*ma*]	5′.
[……..] É	«4 GAŠAN$^{?}$ DU$_{8}$»	*a-bal*-⌜*luṭ*⌝	
[…]	4 KÙŠ	*a-bal*-[*luṭ-ma*]	
	5 KÙŠ	*a*-[……]	
	6 KÙŠ	[…]	
	1/2 NINDA		10′.
	1 NINDA		
	1 1/2 NINDA		
	2 NINDA		
	[2] ⌜1/2⌝ NINDA		
	[3] NINDA		15′.
	[…]		

The second two verbal forms in reverse column i′ are perhaps to be restored as ‘I scratch, I scratch and’, ‘I say, I say and’, ‘I live, I live and’ (cf. Gesche 2001: 119 *mrṭ*, 120 *qbī*, 114 *blṭ*) although other verbs are also possible. In column ii′ the line between 3 KÙŠ and 4 KÙŠ is probably an intrusion from column iii′. The model contract in column iii′ is restored following Gurney’s notes on the Ashmolean Museum index card. It can be translated ‘… Nabû-aḫḫe-b ni […… descendant] of Egibi [……] concerning [……] 8 shekels from [……] its man$^{?}$ [……] house$^{?}$ [……]’. See also Gesche (2001: 147–8); *OECT* 11: 35–36.

36. Ashmolean 1924.1464 + 1924.2006 + 1924.2068

Fragment from centre of school tablet, type 1a or 1b: obverse lexical list Hh III 208–224, 165–167 (Akkadian — not transliterated here), reverse metrological list (lengths). Copies of obverse in *MSL* SS1: 9 and *OECT* 11: 140; cf. Gesche (2001: 785).



Reverse

…]
1′. ⌜6 ŠU⌝.[SI]
⌜7⌝ ŠU.⌜SI⌝
1/3 KÙŠ
⌜9⌝ ŠU.⌜SI⌝
5′. 10 ⌜ŠU.SI⌝
⌜11⌝ ŠU-⌜SI⌝
[…

37. Ashmolean 1924.1760

Fragment from reverse of school tablet, type 1b: column i′ cf. Hh XVIII, column ii′ spellings, column iii′ metrological list (lengths), column iv′ traces. Copy in *OECT* 11: 139; cf. Gesche (2001: 785).

Reverse column iii'	*Column ii'*	*Column i'*	
…]	…]	…]	
5 ŠU.⌜SI⌝	*it-*[……]	ŠE.GU_4.⌜KU_6⌝	1′.
6 ŠU.SI	*it-tag-*[…]	UBI.⌜KU_6⌝	
7 ŠU.SI	*it-tag-*⌜*ga*⌝-[…]	UBI.SIG.⌜KU_6⌝	
1/3 KÙŠ	*u-rím*!	⌜UBI?⌝.[……]	
9 ŠU.SI	*u-ri-im*	[…ŠU.SI	5′.
10 ŠU.SI	[…]-*iš*		
11 ŠU.SI	*u-meš*		
⌜1/2⌝ KÙŠ	*u-me-*[*eš*]		
[13 ŠU].⌜SI⌝	*u-kiš*?		
[…ŠU	[*u*]-*ki-*[*iš*]		10′.
	[…ŠU		

The entries in column i′ do not exactly match any of the standard lexical lists, but compare the list of fish in Hh XVIII 10–13 (*MSL* 8/2: 96–101). The first surviving verbal form in column ii′ could be restored in various ways; the rest should perhaps be translated, 'I/he covered up' (*'rm* D), 'I/he scorned' (*m'š* D), 'I/he expelled' (*'kš* D); none are attested in the Neo-Babylonian school texts edited by Gesche (2001: 111–23).

38. Ashmolean 1924.1847

Fragment from centre of school tablet, type 1a or 1b: obverse Hh II 202ff? (badly damaged; not transliterated here); reverse column i′ spellings, column ii′ metrological

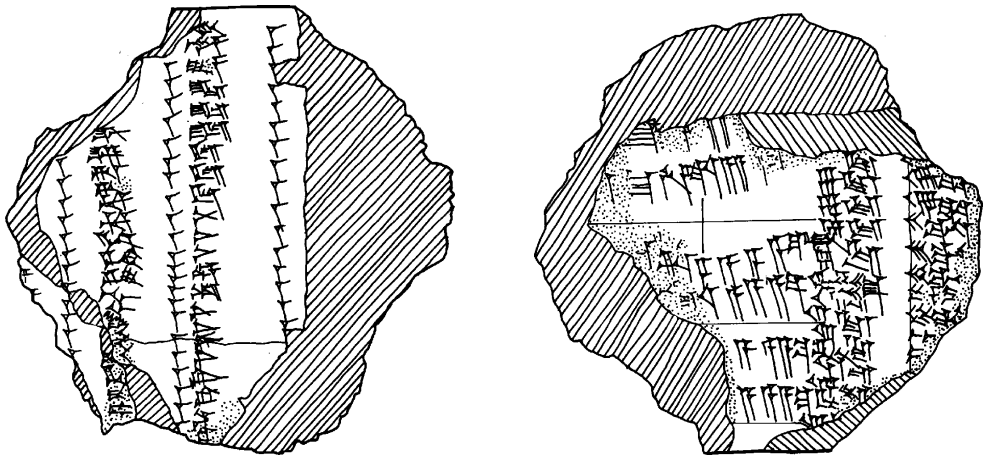
list (lengths); column iii′ only the sign KA preserved. Copy in *MSL* SS1: 62; cf. Gesche (2001: 785).

Reverse column ii′	*Column i′*	
…]	…]	
⌜14 ŠU.SI⌝	*a*-[……]	1′.
15 ŠU.SI	*a*-[……]	
16 ŠU.SI	*a-za*-[……]	
17 ⌜ŠU⌝.SI	*a*-⌜*za*?⌝-[……]	
⌜2/3⌝ KÙŠ	*a*-⌜*ḫa*?⌝-[……]	5′.
[19] ⌜ŠU⌝.SI	*a*-[……]	
[…	*a*-⌜*za-am*?⌝-[*mur*?]	
	a-za-⌜*am*⌝-[*mur*?]	
	a-la-[……]	
	a-qa-[……]	10′.
	a-pa-[……]	
	[*a*]-*pa*-[……]	
	[…	

One of the surviving verbal forms in column i′ should perhaps be understood as ‘I sing’ (cf. Gesche 2001: 123 *zmr*).

39. Ashmolean 1924.1196

Fragment from upper half of school tablet, type 1b: obverse Vocabulary S^b A, lines 60–65+, 91–110 (not transliterated here), reverse columns i′–ii′ metrological list (capacities), columns iii′–iv′ spellings. 60 GÍN (‘shekel’) = 1 MA.NA (‘mina’), 60 MA.NA = 1 GUN (‘talent’), *c*.30 kg.



The verbal forms in column iii′ overlap considerably with the metrological list to the right of them, while those in column iv′ are only partially preserved. The entries in column iii′ are all preceded by *ai* ‘no!’; but one expects *ai* to be followed by verbs in the preterite, not the present as here. The last four lines of column iii′ are perhaps to be tentatively translated as ‘may I not hit’, but they are very difficult to read.

Reverse column iv′	*Column iii′*	*Column ii′*	*Column i′*	
…]	…]	…]	…]	
[…] X [TAR]-⌜*šá*⌝	⌜*a-a*⌝ […….]	[5] GÍN	⌜16⌝ [MA.NA]	1′.
[…] X TAR-*šá-ma-šú*	*a-a* ⌜*a*⌝-[…….]	6 GÍN	⌜17⌝ [MA.NA]	
———————	———————	7 GÍN	18 [MA.NA]	
[…] X-*uš-šá*	*a-a a-ma-aḫ*$^{?}$-*ḫaṣ*$^{?}$	8 GÍN	19 MA.[NA]	
[…….] X-*ma-šú*	*a-a a-ma-aḫ*$^{?}$-*ḫa*$^{?}$-*áṣ*$^{?}$	⌜9⌝ GÍN	20 MA.NA	5′.
———————	———————	[10 GÍN]	30 MA.⌜NA⌝	
[…….]	*a-a a-ma-aḫ*$^{?}$-*ḫaṣ*$^{?}$	⌜11⌝ [GÍN]	40 MA.⌜NA⌝	
[…….]	*a-a a-ma-aḫ*$^{?}$-*ḫa*$^{?}$-*áṣ*$^{?}$	12 GÍN	⌜45⌝ [MA.NA]	
	———————	13 GÍN	50 MA.[NA]	
		⌜14 GÍN⌝	1 ⌜GUN⌝	10′.
		⌜15 GÍN⌝	2 [GUN]	
		⌜16 GÍN⌝	[…]	

40. Ashmolean 1924.1242

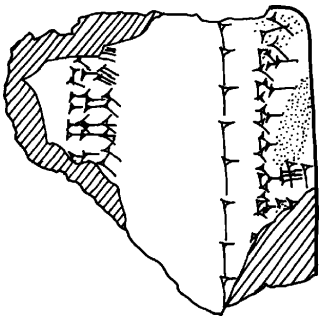
Fragment from middle of school tablet, type 1b: obverse Syllabary S^{a} 180–189, 230–247, 275–288 (not transliterated here); reverse columns i′–ii′ metrological list (weights), columns iii′–iv′ spellings. Copy of obverse in *OECT* 4: 123; cf. Gesche (2001: 785).

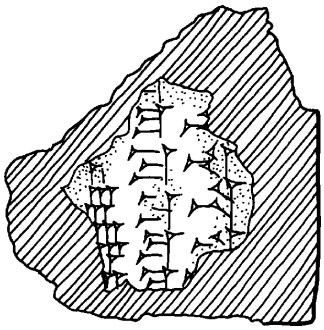
Column iv′	*Column iii′*	*Column ii′*	*Column i′*	
…]	…]	…]	…]	
[…….]	⌜*a*⌝-[*man-zaq*]	20 MA.[NA]	10 [GÍN]	1′.
[…]-*a-mi*	*a-man-za-aq*$^{!}$	30 MA.[NA]	11 [GÍN]	
———————	———————	40 MA.NA	12 [GÍN]	
[…]-*šeš*	*a-kaš-šad*	50 MA.NA	13 [GÍN]	
[…]-*ší-eš*	*a-kaš-šá-ad*	1 GUN	14 [GÍN]	5′.
———————	———————	2 GUN	15 [GÍN]	
[…]	⌜*a*⌝-*kaš-šad*	3 GUN	16 [GÍN]	
	[*a*]-⌜*kaš*⌝-*šá-ad*	4 GUN	17 [GÍN]	
	[…]	5 GUN	18 [GÍN]	
		6 GUN	[…]	10′.
		7 GUN		
		8 GUN		
		9 GUN		
		10 GUN		
		11 GUN		15′.
		———————		
		[…]		

The verbs in column iii′ can be translated as ‘I suck’, ‘I reach’ (cf. Gesche 2001: 119 *mzq*, 117 *kšd*); there are several possible restorations for the remains in column iv′.

41. Ashmolean 1924.2214

Fragment from right edge of school tablet, type 1a or 1b: obverse Syllabary S^{a} 238–242, 301–306 (not transliterated here), reverse metrological list (weights).





Reverse

…]
1′. […3] ⌜MA⌝.[NA]
[…4] MA.⌜NA⌝
⌜…5⌝ MA.NA
[…]6 MA.NA
5′. […]7 MA.⌜NA⌝
[…]⌜8 MA.NA⌝
[…

Mathematics in Neo-Babylonian Kish: conclusions

Metrological lists seem to have occupied very much the same, marginal position in the scribal curriculum of both Kish and Babylon. Gesche (2001: 816) lists just 36 Babylonian school tablets containing 'numerical' lists amongst her total corpus of over 700 (Gesche 2001: 36), six of which are from the temple of the god Nabû *ša ḫarê* in Babylon (Cavigneaux 1981). Of the 24 that Gesche and Cavigneaux edit or describe, almost all are metrological lists (of capacities, weights, or lengths) written on the back of Type 1a or 1b tablets along with 'non-canonical' exercises just like those from Kish edited here. Only one Type 1b tablet contains a line from a table of squares '[8] A.RÁ 8 1 04', repeated at least three times (BM 53939: Gesche 2001: 378–80). Another, written by an advanced student on a Type 2a tablet (see Gesche 2001: 50), has a literary extract and a list of plants on the obverse and a table of squares (originally from 1 to 30?) on the reverse (BM 57537: Gesche 2001: 436–8). The Kish and Babylon evidence taken together thus suggest that the mathematical elements of elementary scribal education in the mid-first millennium BCE consisted *only* of metrological lists and tables of squares.

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While this article was in press, in late April 2004, David Fowler and Jeremy Black died. David taught me history of mathematics when I was an undergraduate at Warwick, and insisted that I learn cuneiform if I was to seriously study Mesopotamian mathematics. Jeremy took me on as a graduate student at Oxford, and ensured that I did learn cuneiform and much else besides. Both have been great friends and mentors to me over the last fifteen years, fundamentally shaping my attitude to writing and research, to academia, and to life at large. I thank them both for all they have given me.

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