

SUMERIAN ACCOUNTING PRACTICES. SOME PIECES OF TEXTUAL EVIDENCE

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Bertrand Lafont
(CNRS Nanterre)



Spacio-temporal background: the Sumerian civilization
in Southern Irak during the IIIrd millennium B.C.

(Map M. Sauvage)

2 main reference books:

- H. Nissen, P. Damerow, and Robert K. Englund, *Archaic Bookkeeping. Writing and Techniques of Economic Administration in the Ancient Near East*. Chicago: University of Chicago Press, 1993
- M. Hudson and C. Wunsch (ed.) *Creating Economic Order*. Bethesda, MD: CDL Press, 2004 (papers of R. Englund, M. Van de Mieroop, P. Steinkeller, W. Hallo, E. Robson)

- Accounting formats: main source for understanding economic practices from the time the first written records appear.
- The formats designed by the Sumerians reflect how the large institutions worked administratively and how they managed their extensive landholdings and herds, their workshops and specialization of labor
- To coordinate these activities creation, from the very beginning of writing, of a cluster of interlocking innovations in a unified-field approach.

Archaic tablet from Uruk.
Administrative account
(around 3000 B.C.)



- Starting point: an administrative calendar based on uniform 30-day months and 12-month years
 - sexagesimal system of counting and dividing into 60ths
 - matching sexagesimal set of weights and measures to allocate rations to the work force for monthly and daily use.

- Grid of equivalencies in which barley (še) and silver (kubabar) emerged as a kind of "money-of-account." With these two commodities, joint standard of value enabling disparate transactions to be organized into an integrated system in which an overall balance can be prepared to measure the net gain or loss.
- Relative value of silver and barley = monetary pivot of this accounting system:
→ one shekel of silver conventionally set as equal in value to one gur ("bushel") of barley.
- Sumerian weights and measures divided into sexagesimal denominations, convenient for distribution on the basis of the 30-day administrative month as rations to the workforce.

Grain (še) measured in volumetric gur units divided into multiples of 60 (initially into 300 sila [ca. 300 liters]). One gur-measure of grain = the unit needed to sow one gán-area of land [ca. $\frac{1}{3}$ ha].

- This enabled the large institutions to calculate the rations needed to produce textiles or bricks, build public structures or dig canals during any given period of time.

- Administrators calculated the lead times involved in planting and harvesting crops, estimated their prospective yields and rental charges, and set prices for the inventories they advanced to merchants.

It was through such organizational planning that these institutions could produce and manage systematic annual surpluses.

- According to P. Steinkeller, complex economies, even on the scale of archaic Uruk and other Sumerian cities, could have functioned without accounting, but could not have processed this information for forward planning and economic cost rationalization and for calculating the level of taxes and potential available surpluses.

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- Base de Datos de Textos Neosumerios (BDTNS)
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Fig. 1. — TM.75.G.2346

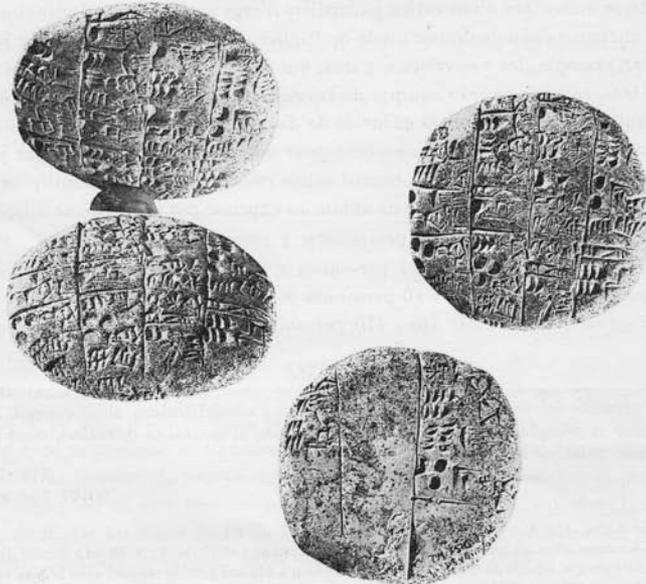
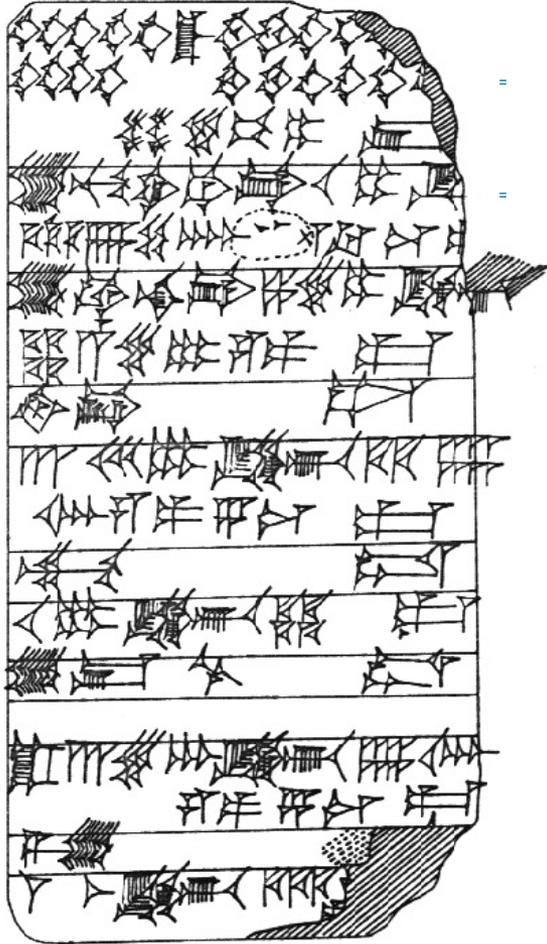


Fig. 2. — TM.75.G.1392

Alfonso Archi,
« Tables de comptes eblaïtes »
Revue d'Assyriologie 83, 1989,
p. 1-6

Obv.



(obverse)

- > 1. 9(šargal)^{gal} 4(šar'u) 9(šár)
2(bur'u) 5(bùr) 2(eše₃) 4(iku) GÁN
 - > 2. še-numun mur-gu₄-bi 1(u) 4(aš) guru₇
3(geš'u) 8(géš) 4(u) 4(aš) 1(diš) $\frac{2}{3}$ (diš) sila₃ gur
- (...)

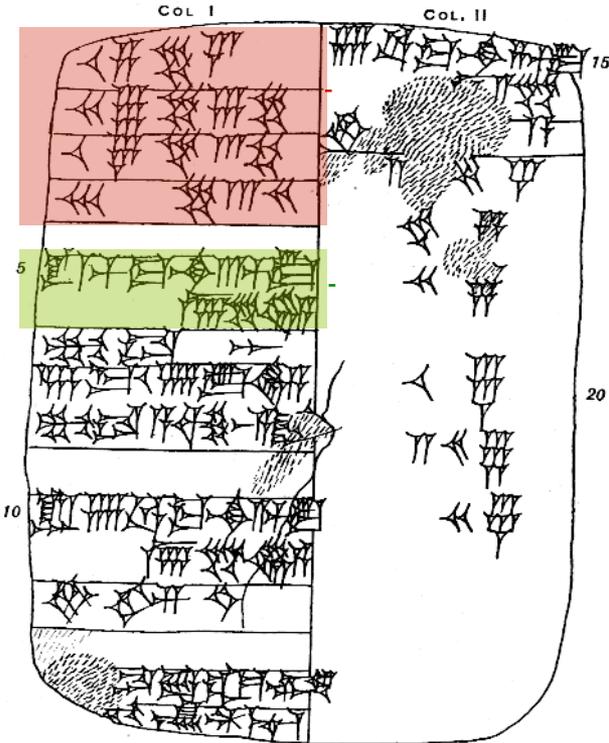
1. 35365 bur and 16 iku of arable land (= around 224 573 ha)
2. Needed seed and fodder (for cultivating that surface):
14 guru₇ 2324 gur 1 $\frac{2}{3}$ sila
= 52324 gur 1 $\frac{2}{3}$ sila = 15 697 201,66 sila/liters

M. Powell, *RA 70*, 1976, p. 98:

“Most of us are accustomed to thinking numerically in the decimal system which characterizes the linguistic structure of our numerals.

It is, however, abundantly apparent that Sumerians did not think this way.

Their sexagesimal mode of thought is only one of the many difficulties of the Sumerian language, but it has obscured for us many of the rather obvious metrological relationships present in Sumerian administrative texts.”



YOS 4, 293 (CDLI P142357)

Col. I

- > 1. 14 54
- 2. 29 56 50
- 3. 17 43 40
- 4. 30 53 20

- 0; 14, 54
- 0; 29, 56, 50
- 0; 17, 43, 40
- 0; 30; 53, 20

- > 5. šu-nigin₂ 1 ½ ma-na 3 ½ gín lá 7 še kù-a
- 6. mu-ku_x(DU) didli
- 7. 7 ma-<na> 19 gín kù-a
mu-ku_x(DU) a-tu₅-a luḡal
- 8. šu-nigin 8 ⅝ ma-na 2 ½ gín
lá 7 še kù-a
- 9. šà im-UD
- 10. [mu]-ku_x(DU) iti ezem-mah
- 11. 'mu` en^dInanna

Total: 1 ½ mana + 3 ½ shekels
minus 7 grains of silver:
various inputs;
and 7 mana + 19 shekels of silver:
input (for) the royal washing ritual

Grand total: 8 mana ⅝ + 2 ½ shekels
minus 7 grains of silver.

Input. Xth month.
Date

Col. II

- 1. 8 ⅝ ma-na 4 ½ gín lá 'x` 2 še
- 2. šà [...]-a
- =====
- (drafts)

The sum of the sexagesimal numbers in lines 1-4
corresponds to the total entered in standard metrological notation in line 5.
These numbers add up to **1;33,27,50** since the following relations hold:

š'	mana (ma-na)	shekel (gín)	grain (še)
mana (ma-na)	1	1,0	3,0,0
shekel (gín)	0;1	1	3,0
grain (še)	0;0,0,20	0;0,20	1

- According to M. Van De Mieroop, the greatest challenge to the ancient accountants was not the recording of a single transfer, but the combination of a multitude of transfers into a summary.
- A good bureaucrat needs to be able to compress data. The summary account requires that the scribe combine information from various records, and that he excludes what is redundant or specific.
- But unlike with paper or papyrus, with clay it is impossible to build up a single account over time, cumulatively, and to get ledgers in which entries are added for days in a row.

→ challenge for the Mesopotamian scribes to produce a summary at a single moment, either with the individual records laid out: in front of them, or (most likely when large numbers of records were involved) on the basis of preparatory accounts that summarized smaller groups of texts.



Tablet « Erlenmeyer 152 »
(CDLI P109319)
R. Englund, *CDLJ* 2003/1

Measurements: 161 x 166 x 36 mm

Summary one-year account from a
labor supervisor in Umma
(XXIth century B.C.)

(“Workdays”: guruš u₄ 1-šè)

UTI 3, 1630 (CDLI P139649)

(tablet: obverse)

1. 135 guruš u₄ 1-šè **135 workdays**
2. a-šà-ge a du₁₁-ga field irrigation work
3. a-šà ^dŠara₂-gú-gal (performed) in the field Šara-gugal
4. ugula Lú-^dšara₂ foreman : Lušara

(reverse)

1. kišib A-gu-gu Seal : Agugu
(seal impression)
2. mu má ^dEn-ki ba-ab-du₈ Date

Lost tablet for the same work, in the same place, and supervised by the same scribe for **42 other workdays**



- Obv. col. 5
21. 177 guruš u₄ 1-šè
 22. a-šà-ge a du₁₁-ga a-šà ^dŠara₂-gú-gal
 23. kišib A-gu-gu

177 workdays: field irrigation work (performed) in the field Šara-gugal.
Seal: Agugu



Hand 1

SACT 2, 31

MVN 18, 397

MVN 16, 1359

NBC 2689

MVN 16, 1567

UTI 3, 1630

UTI 3, 1692

MVN 16, 865

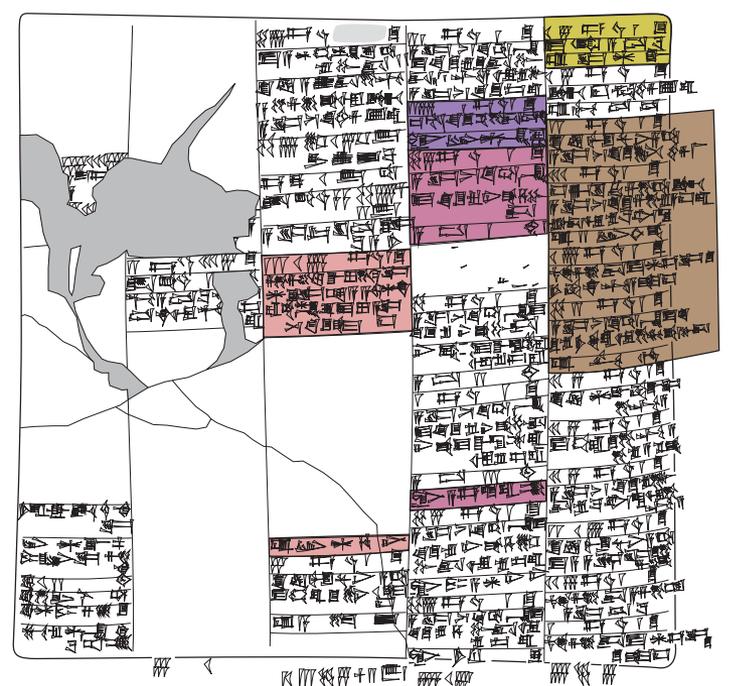
MVN 15, 20

UTI 4, 2608

Princeton 1, 380

MVN 16, 1071

UTI 4, 2919



ETCSL 5.3.2 (Sumerian Debate between Sheep and Grain)

130. ud šú-uš-e níĝ-kas₇-zu ba-ni-ak-e
Every night your count is made

131. **ĝeš-šudum-ma**-zu ki ì-tag-tag-ge
*and your **tally-stick** put into the ground*



132. na-gada-zu u₈ me-a sila₄ tur-tur me-a
so your herdsman can tell people how many ewes there are and how many young lambs

133. ud₅ me-a máš tur-tur me-a lú mu-un-na-ab-bé
and how many goats and how many young kids

□ ePSD: ĝeššudumak[tally]

01/02/12 09:18

ĝeššudumak [TALLY]

(2 instances)

[ĝeššudumak](#) [TALLY] (2x: Old Babylonian) wr. ĝeš-šudum-ma "tally stick"

[1]  ĝeš-šudum-ma (geš-šudum-ma)

+ -0 (2x/100%).

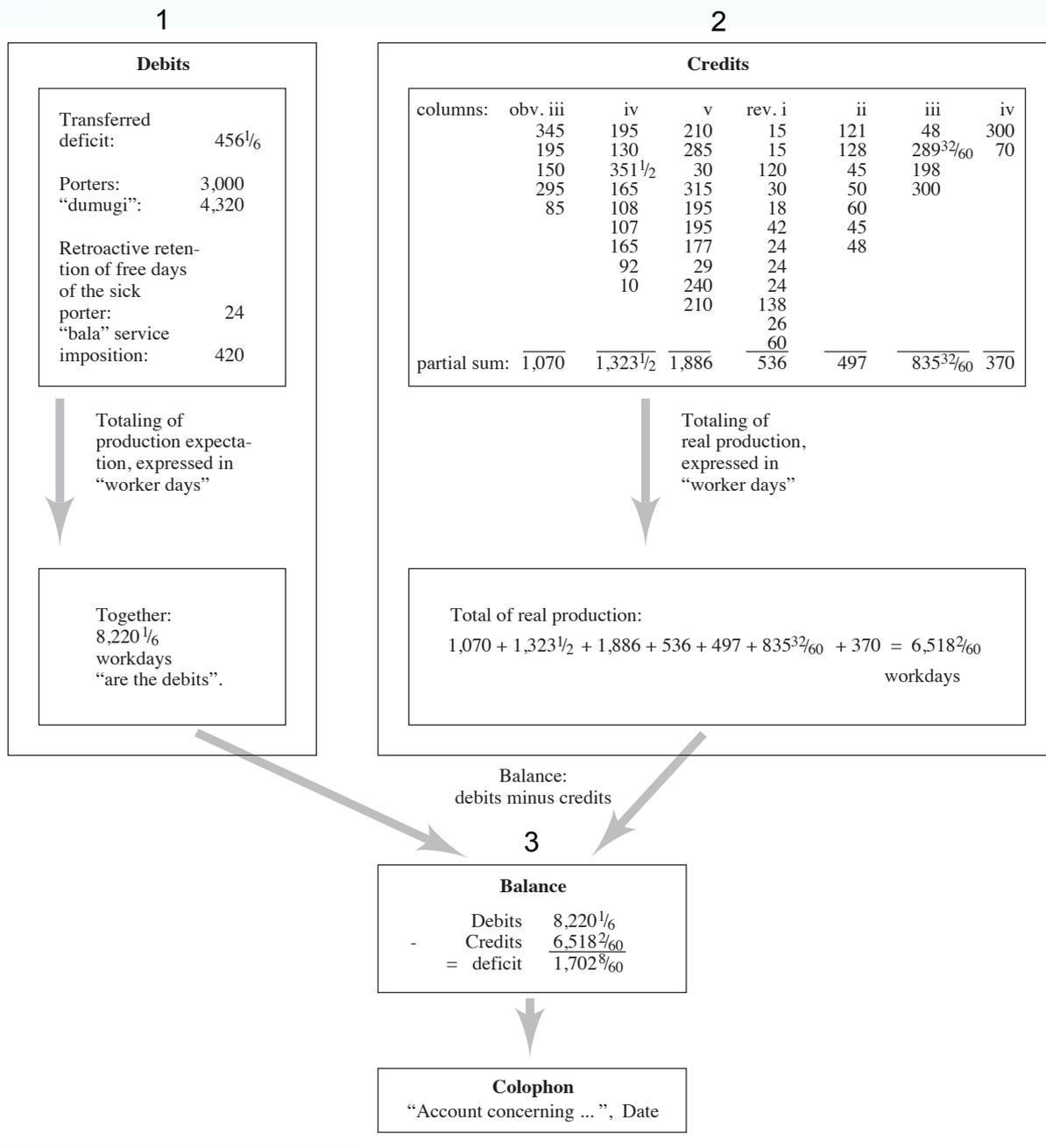
	3500	3000	2500	2000	1500	1000	(no date)
[1]				2			

2 distinct forms attested; [click to view forms table](#).

1. tally stick (2x/100%)

~

See ETCSL: [ĝiš-šudum-ma=tally-stick](#).



1. Débits:
sag-nîg-gur₁₁-ra
(obv. col. 1-3)
= 8220 1/6 guruš u₄ 1-šè

2. Credits:
šà-bi-ta ... zi-ga-àm
(obv. col. 3-5, rev. col. 1-3)
= 6518 2/60 guruš u₄ 1-šè

3. Balance:
nîg-kas₇-ak
(rev. col. 4-5)
Deficit (lá-i)
= 1702 8/60 guruš u₄ 1-šè

Figure 2: The structure and accounting flow of the document Erlenmeyer 152

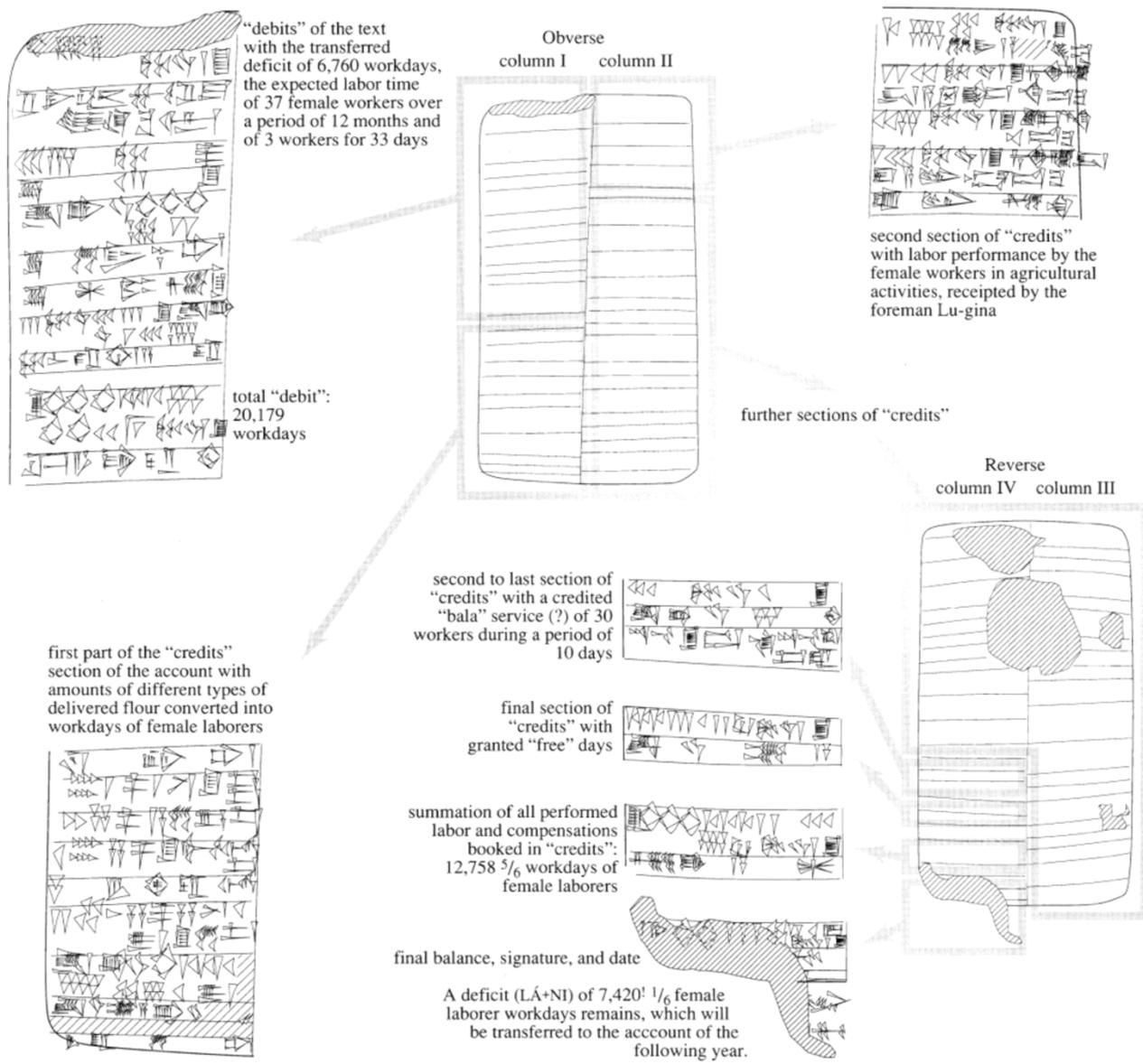


Figure 45. Structure of a neo-Sumerian account concerning female workers in a mill.

(CDLI P112338)

Col. 1

[1 sila₃ = ± 1 liter]

(...)

13. 8(aš) 1(barig) 2(bán) 1(diš) sila₃ zì sig₁₅ gur

2481 sila zisig-flour,

14. 2(aš) 4(barig) 2(bán) eša gur

860 sila eša-flour,

15. 1(u) 8(aš) 4(barig) 2(bán) zì-gu saga gur

5660 sila fine pea flour,

16. 2(barig) níg-àr-ra saga

120 sila fine ground ninda flour,

17. 2(géš) 4(u) 1(aš) 2(géš) 4(barig) 3(bán) 4(diš) sila₃ gín dabin gur

48574 ⅓ sila flour,

18. á-bi u₄ 1(šár) 3(geš'u) 9(géš) 4(u) 6(diš) 1(u) gín

its labor: 5986 days, 10 shekels.

(...)

Category of flour

Quota of production by woman and by day

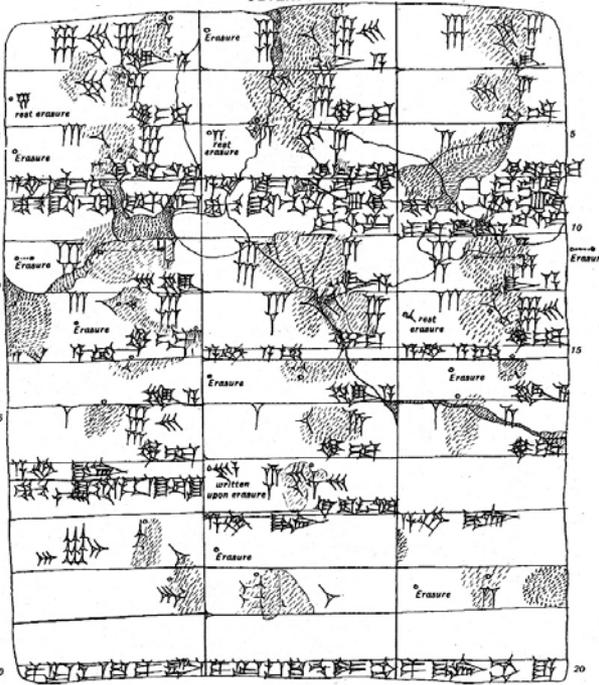
zì-sig ₁₅	(zisig-flour)	→	6 sila ₃ ⅔
zì-gu saga	(fine pea flour)	→	8 sila ₃
dabin	(flour)	→	10 sila ₃
eša	(eša-flour)	→	20 sila ₃
níg-àr-ra saga	(fine ground ninda flour)	→	20 sila ₃

- 1 unit of dabin-flour = 1 unit of unmilled grain (še)
- 1 unit of zisig-flour = 2 units of unmilled grain (še)
- 1 unit of zigu-flour = 2 units of unmilled grain (še)
- 1 unit of eša-flour = 2 units of unmilled grain (še)
- 1 unit of nigara-flour = 2 ½ units of unmilled grain (še)

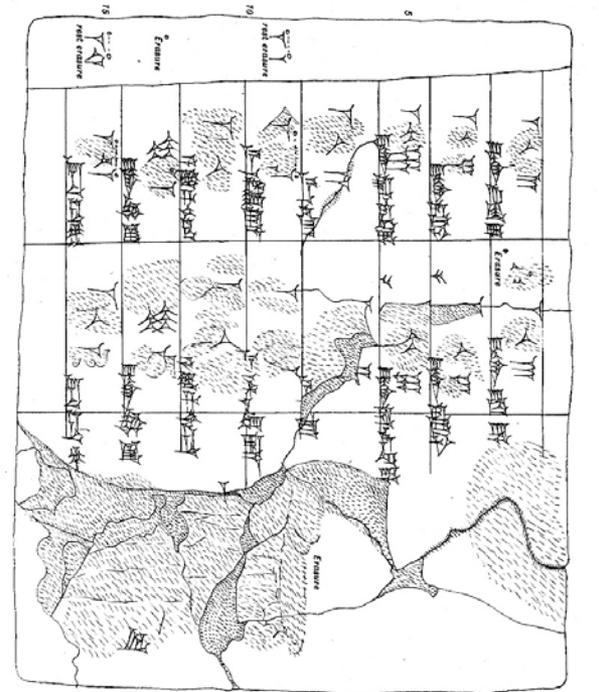
- Detailed accounts of labor norms add a dimension of complexity to the otherwise fairly trivial calculations involved in Ur III administrative accounts.
- Such balance accounts and calculated plan-production have played a major role in Ur III economies that scaled up from the various teams engaged, at basic levels, with field work, canal maintenance, brick construction and fishing, through the administrations of relatively self-sufficient households, from there to province-level accounts, and finally to crown accounts of taxes and tribute, and of the royal expenditures that they funded.



YOS 4, 242 (P142306)
 Tabular account
 Ur III Period
 (XXIth cent. B.C.)



AUCT I, 56 (P102902)
 Tabular account
 Ur III Period
 (XXIth cent. B.C.)



At the very end of the Ur III period:
 first tabular accounts (“spreadsheets”)