

**74) Nabopolassar auditing Eanna’s practice of disbursing barley to prebendary bakers.** — YBC 3457 was published a long time ago by Weisberg 1967 (no. 8), but to my knowledge this unique text has never been explained in its entirety, and its wider implications have been overlooked. It regards a royal intervention in Eanna’s measurement practices with respect to the cult: weight and capacity measures are used to establish a standard quantity of barley to be used for producing a given quantity of *takkasû* offering (bread). The weighing of barley is unusual, the closest parallel is found in Borsippa (Waerzeggers 2010: 64-65, where our text is mentioned in note 334). However, the ‘sacrificial *manû*’ of Borsippa seems to be different from the normal weight measure, which arguably is used here. I suggest that this text is about calibrating capacity measures against weight measures.

YBC 3457 = YNER 1, 8 (collated)

1            2 <sup>gis</sup>bán<sup>mes</sup> ana ma-nu-ú ina igi lugal  
               ina <sup>ka</sup>qát<sup>l</sup>-nu ki-i iḫ-ḫi-iḫ  
               35 ½ ma.na re-e-šī 1 bán tak-ka-su-ú  
               ki-i iš-šú-ú 8 ma.na ḫa-a-tu  
 5            a-na <sup>li</sup>mu<sup>me</sup> i-qab-bi  
               <sup>um</sup>l-ma al-la a-ga-a la tu-ban-<sup>l</sup>na<sup>l</sup>-a  
 l.e.        lib-bu-ú šá <sup>en</sup>ba-nu  
 rev.        7 ½ ma.na še.bar a-tar<sup>as</sup>-ti  
               ina igi-ni-ku-nu ter-ra-a-ma  
 10         in-na-a’ ù ina lib-bi a-ga-a  
               lu-ú ú-šú-uz-za-tu-nu  
               iti.še ud.8.kam mu.19.kam aag-a-ùru  
               lugal tin.ti<sup>ki</sup>

“When 2 wooden *sūtu* measures were weighed against the mina in the king’s presence in the Narrow Gate, (the result was) 35 ½ minas. When (the king) made a check for one *sūtu* of *takkasû* (bread), 8 minas (of barley) turned out to be the necessary raw material. So (the king) said to the bakers: ‘you should not use more than this for the preparation of the offerings; the preparation is to be made as it is for Bēl (i.e., in Esangila). You have an excess of 7 ½ minas of barley at your disposal (viz., for every *sūtu* of *takkasû* expected from you). Give it back. You should now keep to this (rule).’ 8.12.19 Nabopolassar, king of Babylon.”

1) Reading 2 <sup>gis</sup>bán<sup>mes</sup> 1 *manû* ... does not allow explaining how the result of the measurement could be 35.5 minas. Taking DIŠ as *ana* yields a phrase that expresses well what this text is interested in: capacity measures are converted into weight measures (lit. are being measured (*naḫūtu*) “for” (or “against,” *ana*, “the mina”).

2) The reading *bābu qatnu* for the first signs is certain.

3) The first temporal clause in this text ends in a nominal sentence, as does the second (lines 3b-4). However, in contrast to the main clause of the second sentence (8 ma.na ḫa-a-tu), I suggest ending the first sentence after the quantity, taking *re-e-šī* with what follows. Otherwise, one would have to take *rēšu* as something like “capital amount,” as in “35 ½ minas were the ...”. This is not normal LB usage for this word. Also, the following sentence would not yield any convincing sense in this reading (neither metrologically nor regarding the literal interpretation of *našû* “take away”), whereas the phrase *rēš x našû* “to check, examine, investigate x” works well.

7) This sentence could mean: “as it is done for Bēl it is fine,” or “it is (to be) presented as it is done for Bēl.” As the second alternative takes up the specific meaning of *bunnû* in line 6, it is preferable.

8) The phonetic complement refers to the frequent rendering of /rt/ as [št].

The language in this text is highly technical and terse, and much information is implicit rather than explicit. The interpretation of the difficult first part of the text follows from the second part (l. 6ff.). There, it is clear that the bakers of Eanna have been issued with barley for the preparation of the offerings (*bunnû*) in excess of expected standards; they are required to give back the excess and are enjoined to keep to the standards forthwith, following the Esangila temple’s best practice. From this, it follows that this quantity of barley is under discussion in the text’s first part. Understanding this part is not straightforward, though.

First, it should be noted that all the quantities referred to explicitly in this text are small and certainly would not merit royal involvement if they were all that is at issue here. The point that is being made is one of principle, of establishing a standard. The actual amounts of grain to be redistributed as a consequence of the royal decision would have been a multiple of what is discussed here, the calculation being based on the standard figures sanctioned by the king. Lines 3-4 say that the king established that one *sūtu* of *takkasû* bread (6 litres) required the input of 8 minas (4 kgs) of barley. These lines are the metrological anchor for understanding the text, in that they show that notwithstanding the oddity of weight measures being used for

grain, the common mina and the common *sūtu* are used. This is borne out by the following rough calculation: one kilogram of barley or wheat today is said to produce some 0.8 kgs of flour; therefore 8 minas = (4 x 0.8=) 3.2 kgs of flour. These, at 0.6 kg per litre, equal 5.33 litres. Thus, if *takkasū* bread made of 8 minas = 3.2 kgs of flour gained about 12 percent in volume through baking, we would arrive at the required 6 litres. The text states that this ratio of 8 minas of barley for 6 liters of *takkasū* is the standard used in Esangila, which also the Eanna's bakers should follow. According to lines 8-10, the bakers are required to return 7.5 minas of barley as a consequence of that decision, so one can deduce that they were issued with 15.5 minas originally. (As stated above, the text is concerned with standards, so we should understand these quantities as relative, in the sense that the temple had originally issued 15.5 minas of barley for every *sūtu* of *takkasū* expected from a baker, and subsequently, according to the king's decision, for each expected *sūtu* of *takkasū*, 7.5 minas of barley of the original 15.5 minas were to be returned.) Consequently, the first part of the text must contain the information about the excess quantity the bakers were issued with.

I understand lines 1-3 to say that two wooden *sūtu* measures were found to weigh 35.5 minas. This result, combined with the information that one *sūtu* of *takkasū* requires 8 minas of barley, yields the conclusion that 7.5 minas of barley should be returned.  $8+7.5 = 15.5$ ; this number, indicating the net quantity of barley issued to the bakers, is clearly connected with, or rather, contained in, the 35.5 minas. The solution must be to take as written the explicit statement that 2 <sup>gis</sup>bán<sup>meš</sup>, two *sūtu* measures, and not two *sūtu* (barley), were weighed: two wooden containers are meant, and they were full when they were weighed. Together these containers would have held 15.5 minas = 12 litres of barley, and consequently each would have had the net weight of 10 minas. Indeed, 7.75 minas of barley, 3.875 kgs, equal (at  $1\text{ l} = 0.62\text{ kg}$ , Jursa 2010: 448<sup>2496</sup>)  $6.25 \approx 6\text{ l}$ . As for the weight of the containers, this was clearly standardized at 10 minas. We know that they were made out of wood, and, as they were used in the cult and were considered to be calibrated models – as such they were inspected by the king, after all – it is certain they were well-made, massive objects, and quite possibly made out of precious materials. We cannot be sure of their shape and exact make-up, so we will assume, *argumenti causa*, that they were simple cylinder-shaped containers carved from solid date palm wood that could hold 6 litres exactly. Date palm wood has an average density of 0.46 g/cm<sup>3</sup> (Elkhal *et al.* 2022). Hypothesizing for instance a plausible opening of 20 cm diameter and an outer diameter of 27 (wall thickness throughout: 3.5 cms), we get an inner height of 19.1 cm and an outer height of 22.6 cm. The resulting  $(12940-6000)=6940\text{ cm}^3$  of date palm wood would weigh 3.2 kgs. The same container made out of cedar of Lebanon (*erennu*, 0.58 g/cm<sup>3</sup>, [https://www.engineeringtoolbox.com/wood-density-d\\_40.html](https://www.engineeringtoolbox.com/wood-density-d_40.html)) would weigh 4 kg, if sissoo wood (*musukkannu*, Dalbergia sissoo, 0.77 g/cm<sup>3</sup>, <https://www.wood-database.com/sissoo/>) had been used, we would arrive at 5.3 kgs, and of course the wooden container might have had additional (metal?) fittings. It is therefore quite plausible that the empty *sūtu* container weighed 5 kgs, and the full, 8.875 kgs (17.75 minas;  $x2 = 35.5$ ).

In short then, the king's inspection found a) that the bakers of Eanna customarily received two *sūtu* of barley for making one *sūtu* of *takkasū* (implicit), b) that these two *sūtu* of barley, weighed together with the standardized wooden *sūtu* measures used in the temple, amounted to 35.5 minas (explicit), the weight of a *sūtu* measure being 10 minas (implicit), c) that therefore the bakers had received 15.5 minas for making one *sūtu* of *takkasū* (implicit), d) that for making one *sūtu* of *takkasū*, only 8 minas of barley were actually necessary, as by the standard followed in Esangila (explicit), and e) that as a consequence, 7.5 minas of barley were to be given back (explicit) for every *sūtu* of *takkasū* for which the bakers had been issued materials (implicit). This royal ruling cannot have been particularly popular among the community of temple bakers in that it amounted to a massive curtailing of their incomes while the share of the gods remained untouched: in essence, the king eliminated a priestly privilege.

The wider implications of this text in the light of other pertinent documents (NBDMich. 52, BM 114552 // BM 114555) will be discussed elsewhere. Regarding metrology and the king's role as a guarantor for the precision of weights and measures in a cultic context, the calibration of capacity measures against weight measures is particularly striking. As for the historical background, suffice it to state the text belongs into the wider context of the gradual affirmation of royal authority over temple institutions in the first decades of the Neo-Babylonian empire. As in other cases, the standards promoted by the Neo-Babylonian kings for this purpose are those of the Esangila temple (most recently, Jursa and Gordin 2019: 44-50), but this is the first time in which such a reference to Esangila practice can be attributed to Nabopolassar.

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