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Richard Firth

Fulling Agents Supplied to a Fuller's Workshop in Garšana

The aim of this note is twofold. Firstly, it sets down the fulling agents supplied to the workshop of a fuller in Garšana (2032-2026 BC), which was a town in the Umma district of Mesopotamia in the Ur III period. Secondly, it considers the role of these fulling agents within the work of the fuller.

The fulling agents are recorded on the Neo-Sumerian tablets published by Owen and Mayr (2007). Many of the Ur III tablets were not excavated using archaeological procedures and were sold as antiquities and, as a consequence, there is now even doubt about the geographical location of Garšana. Thus, it is most unlikely that the list of records described is complete. Nevertheless, there is a sufficient number of tablets to give a clear indication of the fulling agents used by the fuller of Garšana. The aim of this note is to make this information more readily available to students of ancient textiles.

The Sumerian term for fuller is ^{lú}ázlag, which can be literally translated as 'textile man'. The name of the fuller of interest at Garšana is |PÙ. ŠA|-a-ku-um and his name appears repeatedly in connection with the receipt and dispatch of textiles and with the receipts of fulling agents and equipment for fulling.[1] This particular fuller has been selected from the inscriptions of the Ur III period because of the extent of preservation of the records dealing with his supplies and their lack of ambiguity.

Table 1 is a summary of the 20 records of supplies of fulling agents to |PÙ. ŠA|-a-ku-um. These records extend over the 7 years, from the 6th year of the reign of Šu-Sin to the end of the 3rd year of the reign of Ibbi-Sin (*i.e*. 2032-2026 BC). The dates are given according to the year of the reign of Šu-Sin and his successor, Ibbi-Sin; the Roman numerals record the month.

It is important to emphasise that these impressive quantities of fulling agents were supplied to a single fulling workshop during the course of only 7 years. Furthermore, as already noted, these form only part of the total used because of the nature of the excavation and preservation of these records.

In addition to these agents for fulling, this fuller received reed baskets, a 30 litre trough (CUSAS 3, 595), a hand mill (CUSAS 3, 601) and an eight-runged ladder (CUSAS 3, 808). There were also mid-ribs of palm-fronds, poplar branches, charcoal and wooden planks (CUSAS 3, 779), at least some of which would very probably have been used as fuel.

The next step is to give a brief description of the

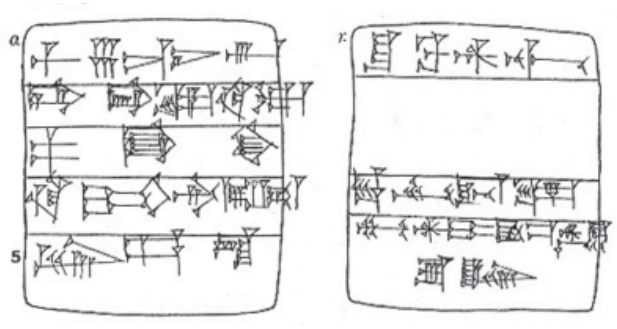

Fig. 1. AUCT 1 458. Tablet from Drehem, line illustration. Courtesy of Marcel Sigrist, the Cuneiform Digital Library Initiative.

purpose of these fulling agents. This is primarily based on the discussion given by Waetzoldt (1972, 168-174). The *im-bábbar* is literally translated as white earth. However, by considering the wider uses of this material, I find it most likely that it is powdered gypsum (Firth 2010). In the context of fulling its use was to serve as an abrasive to give a felted surface to the woven, woollen fabrics.[3]

The alkalis and oils combine together to form the soapy solution which was required to wash the textiles. In the present example, the oils listed are sesame oil and pig fat. In his discussion, Waetzoldt (1972, 169) quotes instances where the oils used were listed as oil, "good oil", sesame oil and pig fat. However, at Drehem, where a large proportion of the tablets list livestock, it is perhaps not surprising that the "oil" product that is most readily available for the fulling process is butter (*ì-nun*).[4] It is worth quoting Levey (1954; see also 1959, 122-123) here:

> Soda and potash were used from plant and wood ash as the most common washing substances in the household, for the cleansing of both clothes and the body. Furthermore, soap plants are found in great abundance in the Near East. The soapwort is a very common sapless shrub growing between Koum and Teheran. *Salsola kali*, the soda plant grows near the Dead Sea today and is common in Syria Egypt, and Arabia. Egyptian soda and potash, to some extent in modern times, is made from the ash of *Mesembrianthemum copticum* and *M. nodiflorum*. The horned alkali plant, *Salicornia*, or *kali* as it is called by the Arabs, found in the deserts east of Palmyra, El-'Asha, and Nejd, is still burned to an ash for its alkali. The horned alkali plant has thus been used for over 5000 years for this purpose.

Waetzoldt (1972, 159) has shown that the ratio of oil to alkali used for the fulling process was approximately 1:5. However, the absolute quantities of oil and alkali used per kilogram of textiles appeared to vary widely, with the quantity of alkali varying from 0.37 to 1.86 litres. The amount of soapiness was obviously governed by the amounts of fulling agents used.

The fullers were also issued with large quantities of barley. It is suggested by Waetzoldt (1972, 174 and footnote 127) that the barley was used to make a beer and that the enzymes from the beer would have a cleaning effect (analogous to that in modern biological detergents). However, it is noted by Gordon (1982, 3, 24) that "oatmeal has a similar drawing and absorbing power to fuller's earth" and was sometimes used for fulling in the textile industry (although, in practical terms, it is less satisfactory than fuller's earth because it is difficult to rinse out). In principle, it seems possible that some of the barley issued to fullers could have been milled into a meal and used in this way rather than as a beer. This suggestion is supported by the receipt by the fuller of a hand mill (CUSAS 3, 601).

The wool was used by the fuller for finishing the textiles. On tablet ITT 2 902+6850 from Girsu, the amount of wool allocated for the finishing of specific textiles is listed explicitly. In this case, it is evident that the weight of wool for finishing is much smaller than the weight of wool in the textiles. The obvious inference is that the wool was used to repair weaknesses in the textile and for any sewing that was required. However, on tablets ITT 3 6606 and ITT 5 6858, the quantities of wool listed are sufficient for decorative features, although Waetzoldt suggests that it is unlikely that such work fell within the direct competence of the male fullers.

Notes

1. |PÙ. ŠA|-a-ku-um occasionally appears as |PÙ. ŠA|-a-kum. In Owen and Mayr 2007, this name is transcribed as *puzur*$_4$*-a-gu*$_5$*-um* or a close variant. The transcriptions of the Sumerian texts used in this paper are based on the listings in the Cuneiform Digital Library Initiative (CDLI) database: http://cdli.ucla.edu/.

2. It is noted that the quantity of sesame oil listed on CUSAS 3, 774 is 1 (aš) gur (300 litres) which is 15 times the next largest delivery of sesame oil (on CUSAS 3, 820). Therefore, there is a possibility that there is an error in the recording of this quantity.

Tablet	Date	Fulling Agents
CUSAS 3, 595	ŠS 6 X	5 litres sesame oil 30 litres pig fat 300 litres 'horned' alkali 60.5kg white earth
CUSAS 3, 621	ŠS 7 III	[n]+120 litres 'horned' alkali
CUSAS 3, 630	ŠS 7 V	60 litres alkali
CUSAS 3, 638	ŠS 7 VI	750 litres barley 7.5 kg wool
CUSAS 3, 642	ŠS 7 VIII	30 kg white earth
CUSAS 3, 665	ŠS 8 II	10 kg wool (5th quality guz-za)
CUSAS 3, 689	ŠS 8 VIII	90 kg white earth
CUSAS 3, 695	ŠS 8 X	35 kg white earth 5 litres sesame oil
CUSAS 3, 699	ŠS 8 XII	0.625 kg wool (5th quality) 3.42 litres sesame oil 30.5 litres 'horned' alkali 11.5 kg white earth
CUSAS 3, 705	ŠS 9 I	1.18 litres sesame oil 52.25 litres 'horned' alkali 4.5 kg white earth 0.0625 kg wool (5th quality)
CUSAS 3, 712	ŠS 9 IV	10 litres sesame oil 10 litres pig fat
CUSAS 3, 733	ŠS 9 IX	[o.n.n] 'horned' alkali
CUSAS 3, 768	IS 1 XI	1200 litres 'horned' alkali 60 kg white earth
CUSAS 3, 770	IS 1 XII	10 litres sesame oil
CUSAS 3, 774	IS 2 II	300 litres sesame oil 30 kg alkali 'bricks' 300 litres 'horned' alkali
CUSAS 3, 785	IS 2 V	30 kg white earth
CUSAS 3, 791	IS 2 VII	180 litres alkali 60 kg white earth
CUSAS 3, 809	IS 2 XII	20 litres sesame oil 300 litres 'horned' alkali
CUSAS 3, 820	IS 3 XI	300 litres barley
CUSAS 3, 822	IS 3 XII	10 litres pig fat

Table 1: Receipts of fulling agents by |PÙ. ŠA|-a-ku-um

Material		Quantity
im-bábbar (im-babbar)	white earth (gypsum)	381.5 kg
naga si-è	'horned' alkali	2302.75 litres
naga	Alkali	240 litres
sig$_4$ naga	bricks of alkali	30 kg
ì-geš ^{2}	sesame oil	364.6 litres
ì-šáh	pig fat	50 litres
še	Barley	1050 litres
siki	wool (usually 5th quality)	18.2 kg

Table 2: Total quantities of fulling agents received by |PÙ. ŠA|-a-ku-um

3. It is important to stress that *im-bábbar* (white earth) is gypsum (calcium sulphate) and not fuller's earth (which is hydrous aluminum silicate containing magnesium, calcium, and other constituents). This conclusion is based on the use of *im-bábbar* in other contexts (Firth forthcoming).

4. PDT 1, 91 lists 7 litres of butter and 48 kg of white earth; PDT1, 369 lists 15 litres of butter. AUCT 1, 458 (Fig. 1) lists both butter and ga-àr, which is a powdered or finely grated sun-dried curd cheese (Halloran 2006, 69). In this case, this is being expended by the fuller, I-din-èr-ra, and so it is not clear whether the powdered curd-cheese was used, in lieu of oil, for fulling.

firth827@btinternet.com

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