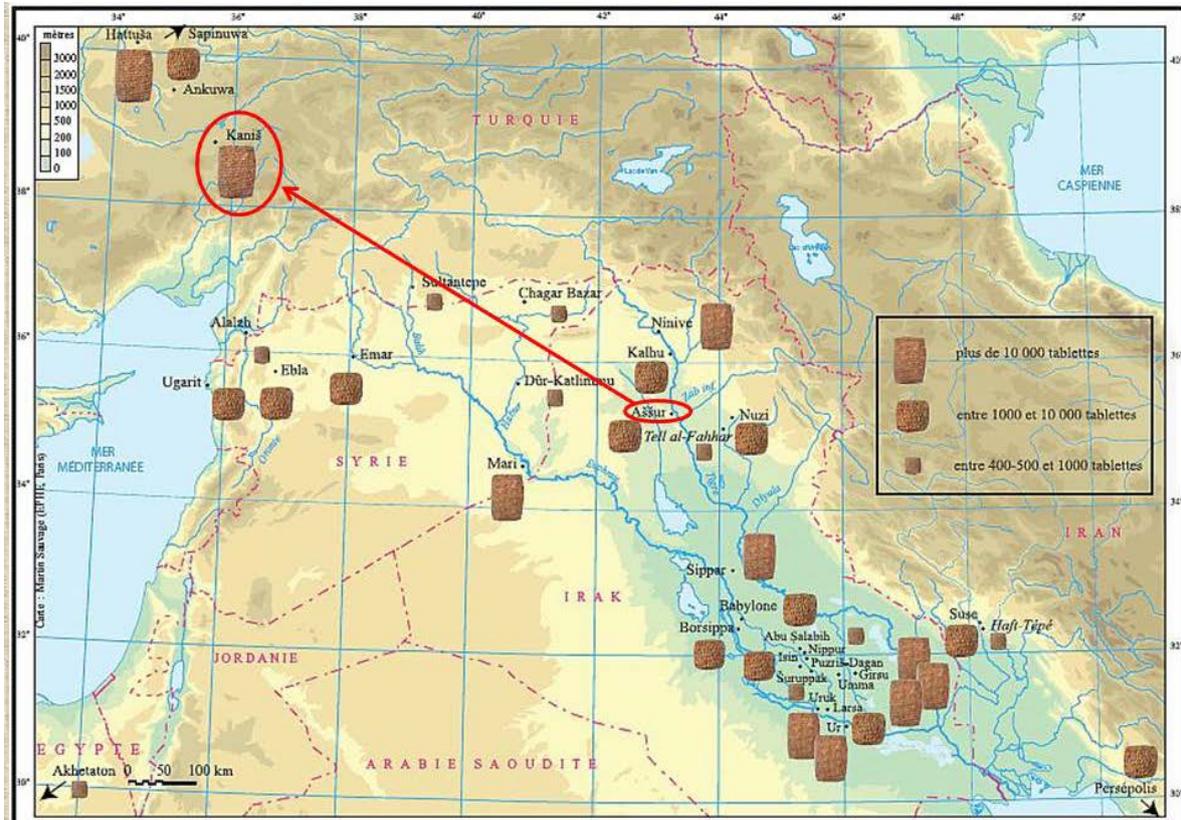
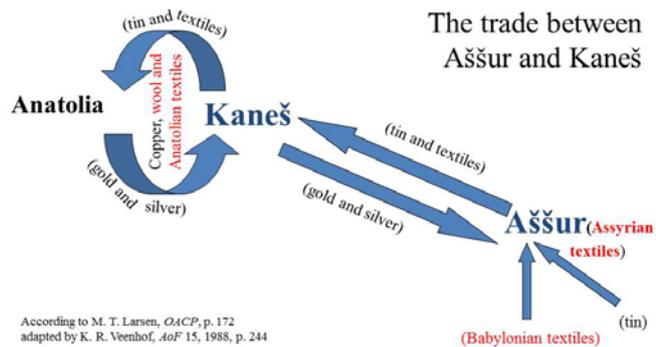


Estimating an Old Assyrian Household Textile Production  
 with the Help of Experimental Archaeology: Feasibility and Limitations

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Cuneiform texts document three millennia of the ancient Near Eastern history. They include details about textile production in large workshops, and in the domestic sphere. This contribution focuses on the private textile production at Aššur during the 19<sup>th</sup> century BCE, (Old Assyrian period). Old Assyrian levels have not been excavated at Aššur, so we lack texts and archaeological remains for this city. To reconstruct the textile production there, we rely on the hundreds of letters sent by the Assyrian women to their family members in Anatolia, especially at Kültepe, the ancient city of Kanēš. There, excavations also provided textile tools. The textile production of the Aššur women had two goals: clothing household members, and fueling the long distance trade. The sale of textiles in Anatolia generated silver revenues for them.



Hands-on experience, based on traditional textile crafts and archaeological textile tools, carried out at the Centre for Textile Research, provides data which can be used together with the textual documentation to estimate the number of textiles produced by a household in Aššur. This paper investigates the methodology to be used when combining the results of experimental archaeology with textual data, and the limitations of this interdisciplinary research.

**1. Sources for a female private textile production**

Textiles remains are very rare in Mesopotamia because of bad climatic conditions. The same applies to wood, and thus, we have no traces of looms. However, new micro-excavation practices have provided some very tiny

pieces of textiles. For the Old Assyrian period there are only small fragments of a white textile decorated with blue faience beads found on the floor of a room at Acemhöyük (south of the Tüz Gölü). But this piece would have been imported from Egypt or the Levant. Textiles are better preserved in the form of imprints on clay. Numerous imprints of textiles on clay labels, tablets, pots or sealing of doors and containers have been found at Kültepe. Indirect archaeological data is also provided by textile tools.



Loom weights have been uncovered in some of the Kültepe lower town private houses, showing both pyramidal and crescent shapes; there were also several spindle whorls. Some loom weights were found in houses belonging to Assyrian families, but it is not clear if they reflect techniques from Anatolia or from Assyria.



Old Assyrian style



Old Babylonian style

As for the iconography, our main sources are the hundreds of miniature scenes engraved on cylinder seals which reflect both Assyrian and Anatolian styles. One of these shows a woman presenting to the god a spindle with thread wound on it. Other seals show dressed figures, and we could perhaps distinguish garments of

Mesopotamians made of tabby fabrics and garments of Anatolians twill weaved.

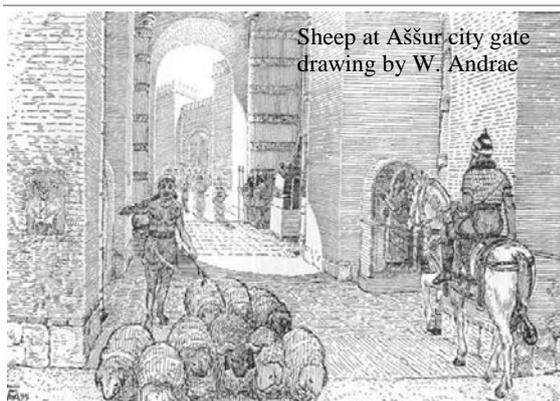
22 500 Old Assyrian cuneiform tablets were discovered in the houses of merchants at Kaneš. The letters, dated to the first half of the 19<sup>th</sup> century, were generated by the long distance trade which provoked the geographical break-up of families; those belonging to the correspondence between women and their male relatives settled in Anatolia tackle many aspects of daily life.

## 2. Female private textile production

Assyrian women did not follow their husbands in Anatolia but stayed in Aššur, at the head of their household. There, they weaved textiles to dress members of the household, but the most important part of their production was exported to Anatolia. Spinning and weaving were the main activities of all the household women, including girls, elderly women and female slaves, perhaps in all a dozen of weavers in wealthy houses. Texts give data about the dimensions of the produced textiles, variety, quality, number and prices, but they do not tell much about the organization of the production and technical aspects.

The know-how of the Assyrian women was appreciated and their husband time to time gave them technical advices. One sent a letter insisting on the thinness of the textile and its density: “Add per piece one pound more of wool than you used for the previous textile you sent me, but they must remain thin! (...) A finished textile that you make must be nine cubits long and eight cubits wide.” Thus, the size of such a textile was 4.5 × 4 metres. This implies that it was not woven in one piece. Their remarks about the textile qualities could be quoted by the women while answering back, showing sometimes some misunderstanding. When Lamassī wrote that she had reduced the size – *i.e.* put less wool – in her textiles, that was not what her husband intended; he wanted denser, *i.e.* warmer textiles: “As for the textiles about which you wrote to me as follows: ‘They are (too) small, they are not good!’ Was it not at your own request that I reduced the size? And now you write (again), saying as follows: ‘Process half a pound (of wool) more in each of your textiles.’ Well, I have done so.” Merchant accounts dealing with the transport of textiles to Anatolia indicate that each piece weighted about 5 pounds (2.5 kg); but letters show that it could be plus or minus one pound of wool.





Women bought raw wool at the city gate of Aššur to the nomads coming each year to pluck their sheep, then cleaned and prepared it for spinning. According to a text from the 21<sup>th</sup> century BCE, a craftsperson would only prepare for spinning about 125 g of wool a day. To obtain the 5 pounds necessary for a textile, it would have taken 20 days.

Experiments made at the CTR have shown that it is possible to spin some 35 to 50 meters of thread per hour. To weave a square meter of fabric, one needs some 2 km of thread, plus 2 to 5 % for the setting of the loom. A

person had to spin for 5 days (5×8 hours) to obtain 2 km of thread.

The Assyrian textiles were 4 × 4.5 meters (18 m<sup>2</sup>), they required 36 km of thread for the weaving, and some 3 months of spinning for a single woman, and the setting of the two or three looms required some 1.8 km, and 4 days of work.

According to the CTR experiments, one person is able to weave about 50 cm per 8 hours day of work, depending naturally on the width of the loom. If we suppose that the fabric was weaved in two strips of 2 meters each which were then sewn together. Two women were necessary to set up the two looms during some 4 days, and two women would achieve the textile in 10 days. If we suppose that the fabric was weaved in three strips of 1.35 meters each. Two women were necessary to set up the three looms during some 6 days, and three women would achieve the textile in 9 days.

Tasks / number of day work for 1 woman	In two strips	In three strips
Cleaning and combing	20	20
spinning	94	96
Setting of the loom(s)	8	12
weaving	20	27
Total of working days/woman	142 [4 3/4 months]	155 [5 1/5 months]
Textiles/woman/year	2 1/2	2 1/3

Woman's letter



Supposing that textile production was performed throughout the year, a woman would have been able to weave at most 2 ½ textiles a year. A healthy household could then have been able to produce a maximum of 25 textiles a year. Out of these, some 5 pieces would be necessary to dress the household members and there were at most 20 textiles sent to be sold in Anatolia.

A large part of the textiles produced by the women of Aššur was sold on the Anatolian market by their male relatives, thus assuring them an income. The current *kutānum*-textile was sold 15 shekels at Kaneš. Once all the taxes deduced, women could hope to get back 10 to 12 shekels a piece. From this price, one has to deduce the price of the raw material. A royal inscription of Šamšī-Adad (18<sup>th</sup> century) indicates that for one shekel of silver, one could buy in Aššur 15 pounds of (raw) wool. Taking into account that during the cleaning process there could be a waste of 30% of the original wool, with 1 shekel of silver it might have been possible to acquire about 10 pounds of cleaned wool, which could be used to weave 2 textiles. With the income of 1 textile, corresponding to 10-12 shekels of silver, a woman could buy wool to produce 20 to 24 textiles. But usually, at most a third of the sale price of a textile was invested in the purchase of wool to produce 6 to 7 pieces.

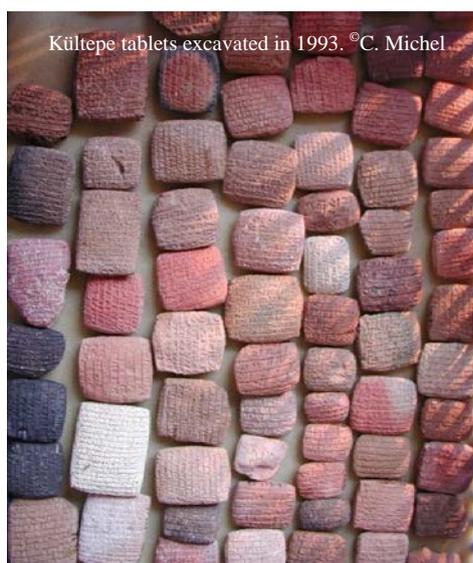
According to these estimations, a household producing yearly some 20 textiles sent for trade in Anatolia would receive between 3 1/3 and 4 pounds of silver per year as gross income, which corresponded to the price of a little house in Aššur. With this silver, women could buy wool to make more textiles, but spent some silver on food and daily life goods. The reminder was sometimes invested in financial operations.

### 3. Limits and uncertainties

In such computations, each parameter is based on assumptions and we still lack a lot of data.

The number of persons per household, and moreover the number of active women, is based on archive and prosopographical studies. It concerns wealthy household in Aššur which are documented by the letters

discovered in the houses of the male family members settled in Kaneš. Reconstructed family trees often lack female members.



Another important parameter is the time period during which women were producing textiles. It has been suggested that it could have been seasonal in ancient Mesopotamia, linked to the agricultural calendar. Such an organization may be possible in villages where families were producing textiles for their own consumption. However in a context of palatial manufactures or in the context of Aššur private production linked to the international trade, it seems more probable that the production was running throughout the year. As well, how many hours were they weaving each day: 8 hours, or 6 hours like the ladies in Bani Hamida (Jordan)?

The size of the textiles may also be questioned: are all the textiles exported from Aššur 4.5 × 4 metres? Are these the dimensions of textiles before or after washing? The caravan accounts show that textiles to be exported had a regular weight of 5 pounds; so commercialized textiles may have been of standard size. But those produced for internal consumption could have been smaller, and thus faster to produce.

In this paper, I have made the hypothesis that Aššur ladies were using a warp weighted loom just like the Anatolian ladies of Kaneš. It has been written that in Mesopotamia, such a loom was not used before a late period. But Catherine Breniquet proved that it was known in Mesopotamia since the 3<sup>rd</sup> millennium BCE.

Last but not least, the density of a textile varies a lot and the proposed data are based on an average of the results of the experiments conducted by the CTR. According to the Old Assyrian letters, it was possible to add 1 pound of wool per textile without changing its size. So according to the type of the textile, the thickness of the thread varied and the weaving was more or less dense.



New studies will help to answer to some of these questions. Eva Andersson Strand, Catherine Breniquet and I have started a study of textile imprints found at Kültepe, in a building dated to the early Bronze Age. These bullae show imprints of textiles, twisted cordages, strings, wood and mainly basketry. They were attached to bags and containers used for storage or transport. On some textile imprints, it is possible to measure the thread which is generally quite thin, and to count the number of thread per centimeters. Among the weaving techniques, tabby and 2-1 twill were observed. Such imprints also exist for the Middle Bronze Age. Some of the bullae were applied to the merchandise brought from Aššur on donkey loads, and thus witness physical traces of the textiles documented by the texts.

Despite the uncertainties listed before, the estimated number of textiles produced per household is quite realistic since it can be confirmed by the textile shipments made by Lamassī to her husband Pūšu-kēn. Four texts linked together show that during an unknown limited period, Lamassī sent a total of 25 textiles to her husband. We do not know the origin of these textiles, but it is most probable that they have been produce by her household.

The estimation of the production of textiles per household and of the income for Aššur women, even if they need to be adjusted, are very important to evaluate the role of women in the economy of ancient Aššur. Such a production has some echoes in the traditional craft projects visited during this fascinating conference.