Textiles Activities in Context: An Example of Craft Organization in Meroitic Sudan

Elsa Yvanez[1]

The past two decades have seen the significant development of settlement excavations in Sudan, especially in the Meroitic heartland, a region encompassing the capital city of Meroe, the surrounding riverine areas, and the Butana hinterlands. Along the eastern bank of the Nile, the Meroitic urban landscape is now defined by a chain of cities regularly spaced every c. 10 km, from Dangeil in the North to Wad ben Naga in the South.[2] Recent discoveries in Central Sudan and the Gebel Barkal region, as well as renewed studies of previous excavation results from Nubia and the city of Meroe, have noticeably increased our knowledge of the Meroitic urban life.[3] Meroitic town structure and organization are also better understood, thanks to the excavation of various settlements such as el-Hassa[4], Damboya[5], Hamadab[6], or Muweis.[7] These settlements show a consistent urban model built around a monumental center — consisting of a temple, a palace, and/or an administrative building — incorporated into residential quarters with domestic and industrial functions. The study of the material unearthed in these settlements has prompted a renewed interest in crafts and their integration in the economy

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2 Baud, "Méroé, un monde urbain"; Wolf and Nowotnick, "The Meroitic Heartland"; Grzymski, "The City of Meroe."

3 Wolf, Nowotnick, and Edwards, "Settlement in the Meroitic Kingdom."

4 Rondot, "El-Hassa: un temple à Amon dans l'île de Méroé."

5 Maillot, "The Archaeological Site of Damboya"; Choimet, "The Meroitic Settlement at Damboya."

6 Wolf and Nowotnick, "Hamadab — A Meroitic Urban Settlement"; Nowotnick, *Ceramic Technology, Production and Use,* passim.

7 Baud, "The Meroitic Royal City of Muweis"; Millet, "Mouweis, une ville de l'Empire de Méroé."

of the Meroitic kingdom.[8] Among the various crafts represented, textile activities are certainly ubiquitous: textile implements are common finds, mainly characterized by a large number of spindle whorls and loom weights.[9] This body of evidence offers particularly interesting counterpoints to other textile implements discovered in Lower Nubia, which tend to come more often from funerary contexts. The sum of this material, added to the thousands of well-preserved textile fragments from the Meroitic and Post-Meroitic periods, paint a vivid image of textile production and uses in ancient Sudan and Nubia.

The spectrum of data coming from the entire geographical span of the Meroitic kingdom presents the rare opportunity to proceed to a modern-standard post-excavation analysis of textile production. We now have at our disposal a vast number of sources recording textile manufacturing and uses: raw material (textile fibers and archaeobotanical remains), textile production implements, finished fabrics, pieces of both clothing and furnishing textiles, archaeological information on the contexts of textile use and reuse, and iconographic representations of people wearing different types of garments.[10] In fact, the only "missing" sources are iconographic representations of the craft itself (scenes showing the process of spinning and weaving for example) and textual data such as written accounts or literary sources.[11]

The study of these different archaeological sources can lead to a comprehensive overview of textile production, which shows that textiles were deeply embedded in the social fabric of Meroitic life. This Meroitic "textile network" encompassed various spheres of the society, from agriculture and fiber collection to the cloth's manufacturing *chaîne opératoire,* all the way through the multiple every day uses and reuses of the fabrics to their final internment with the deceased. The sources and their relations can be summarized in a diagram displaying the interdependence between textiles and their production context (Fig.1).

8 This volume is a perfect incarnation of this renewed interest, as well as ongoing research projects such as the one on metallurgy led by Jane Humphris (UCL Qatar) or G. Choimet's doctoral work, see Choimet, "Habitat et urbanisme méroïtiques en Nubie et au Soudan central." Reappraisals of archival documentation from the Nubian campaign are also bringing new light on craft activities, notably textiles (see Mann and van den Bercken, "Shokan. Revival of a Forgotten Village." A similar dynamic was also at the root of the Meroe Archival Project, reexamining the excavation archives of Peter L. Shinnie from his work in settlement areas at Meroe.

9 For a description of textile implements and activities in a Meroitic and Post-Meroitic context, see for example Adams and Adams, *Qasr Ibrim: The Ballana Phase,* pp. 97—8., Yvanez, "De fil enaiguille : aspects de l'artisanat textile méroïtique."

10 Yvanez, "Clothing the Elite? Patterns of Textile Production and Consumption."

11 These sources are however well known for textile production in pharaonic Egypt (e.g. Vogelsang-Eastwood, "Textiles") or the Ancient Near East (Nosch, Koefoed, and Andersson Strand. *Textile Production and Consumption in the Ancient Near East*).

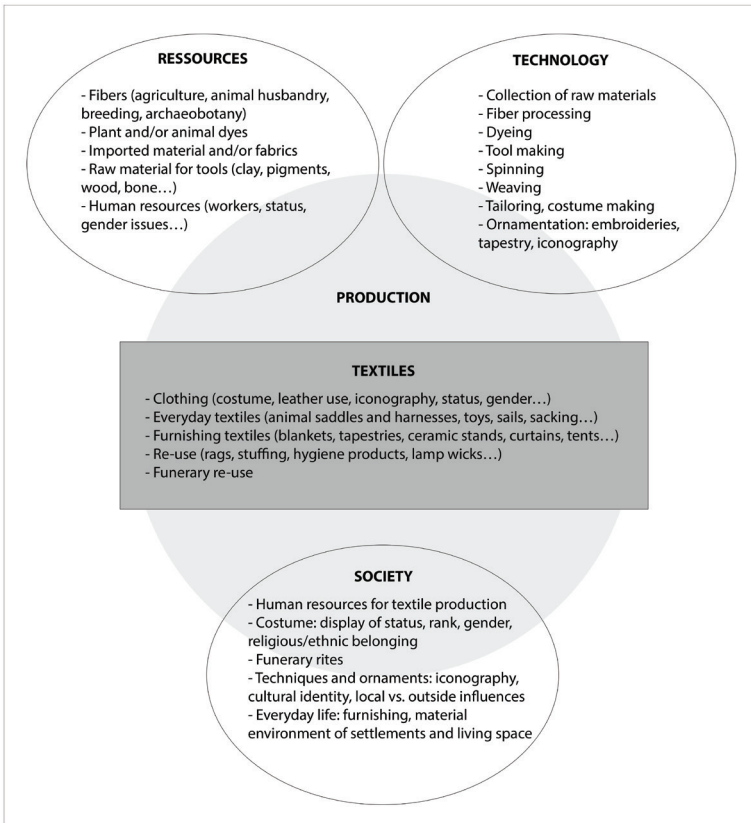

Figure 1. Textile production as interactions between resources, technology, and society (adapted from Andersson Strand et al., "Old Textiles, New Possibilities," p. 151).

Despite the inherent limitations of such theoretical models, this diagram successfully illustrates the textile artefacts within their own production environment. It highlights the results of a complex *chaîne opératoire* based on the interactions between resources (both raw materials and human resources), technology, and society. This outlook has been the underlying theme of recent research in ancient textile studies, which has led to noticeable advances in our understanding of past economies.[12] However, its application in the Nile valley remains restricted, with the exception of Barry Kemp and Gillian Vogelsang-Eastwood's study on the New Kingdom textile industries of Amarna.[13]

12 The aims and methods of recent textile research are usefully exposed in Andersson Strand et al., "Old Textiles — New Possibilities" and Harlow and Nosch, "Weaving the Threads."

13 Kemp and Vogelsand-Eastwood. *The Ancient Textile Industry in Amarna.* Studies developing a similar scope are however blossoming, see e.g. the Marie Skłodowska Curie project EgYarn, led by C. Spinazzi-Lucchesi (MSCA 890144. *Unravelling the thread: textile production in New Kingdom Egypt*, Centre for Textile Research, Saxo institute, University of Copenhagen, 2021-2022). Many Egyptian urban sites continue to bring evidence of an extensive textile production, contemporary with the Meroitic period in Sudan. See for example the cases of Karanis (Thomas, *Textiles from Karanis*), Kellis (Bowen, "A Study of the Textile Industry

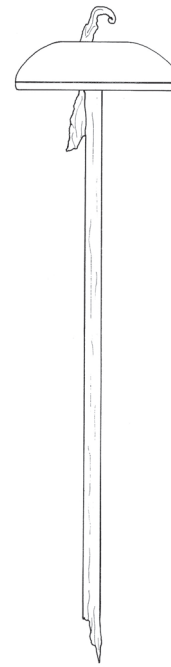

Figure 2. Complete spindle, Ballana, tomb B58. (Reproduced from Williams, *Meroitic Remains from Qustul and Ballana,* vol. 1, p. 159, fig. 61e. Courtesy of the Oriental Institute of the University of Chicago).

At the crossroads between Meroitic archaeology and ancient textile studies, this paper aims to explore the relationship between textile activities and the economy by focusing on the organization of textile production, especially on its integration into the living environment of the Meroitic population. Tila Island and the city of Meroe will provide two helpful case studies: by replacing textile implements in their archaeological locations — within houses and settlements — the present author hopes to identify the different types and scales of textile production occurring in Sudan.

Sources Documenting Textile Production in Meroitic Settlements

Spinning tools are by far the most prominent material source, especially the spindle whorls, which survived in the archaeological record in a much greater number than other wooden or metallic

at Ancient Kellis"), or the Roman-period forts of the Eastern desert (for a comprehensive bibliography, see Bender Jørgensen, "Textiles from Mons Claudianus, 'Abu Sha'ar and other Roman sites").

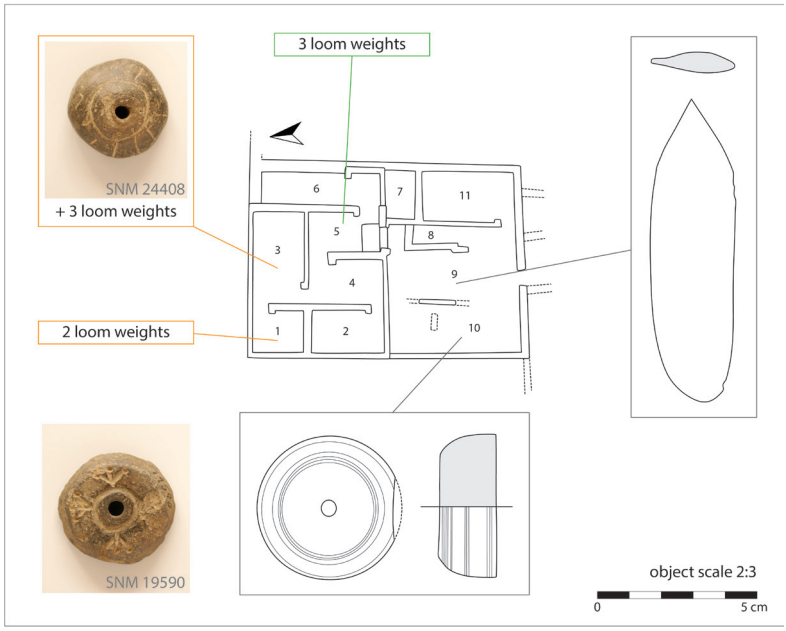

Figure 3. Tila Island, House VI: map and location of textile tools (photographs and drawings E. Yvanez. from A.J. Mills's excavation diaries, map reproduced from Edwards, "Appendix 3. The Meroitic settlement on Tila Island," p. 113, fig. 36).

spindle pieces. Found at Ballana in grave B58, a complete spindle[14] provides a reliable example of this type of tools, its construction and use (Fig. 2).

This simple tool is composed of a spindle shaft and a whorl, placed at the top and secured by the insertion of a metal hook that was used to attach the newly formed yarn. In the hand or suspended and then set in motion, the tool rotates to twist the fibers together and form the thread. Regardless of the specific spinning technique, the spindle whorl acts as a flywheel, which increases the momentum of the spindle and maintains a longer and faster rotation. In Meroitic Sudan, spindle whorls were made of various materials such as ceramic, unbaked clay, wood, bone, stone, or pierced potsherds.[15] Despite this apparent material diversity, there is an interesting dichotomy between the artefacts recovered in Nubia, which favored turned wooden whorls, and those from Central Sudan, where decorated ceramic was clearly preferred (see Figs. 3, 5, 8).

Other types of implements — used for weaving this time — contribute additional material evidence of textile production. Due to the rare preservation of organic material on settlement sites, it has proved impossible to recognize with any certainty the wooden beams that made up ancient looms. However, frequent discoveries of pear-shaped weights indicate that, in Meroitic Sudan and Nubia,

14 Williams, *Meroitic Remains from Qustul and Ballana*, vol. 1, p. 159, fig. 61e.
15 Yvanez, "Spinning in Meroitic Sudan."

most weaving was done on a vertical loom called the "warp-weighted loom," in which the warp threads were drawn tight by a series of loom weights.[16] Often found in sets, loom weights could be made of stone or more commonly unbaked clay (see Figs. 4, 7). Small picks or spatulas made of bone or wood (see Fig. 5) have also frequently been associated with weaving, but their exact use remains unclear and open to debate.[17] They may have been used to pack the threads down on small and delicate areas of the weave or to correct mistakes and seem particularly useful for tapestry weaving.

During settlement excavations, spindle whorls, loom weights, and weaving picks are generally found in the filling of rooms and passageways, or in refuse deposits. They are seldom clearly associated with one specific context of floor level preserved *in situ.* This situation is particularly true in dense habitation quarters and long-lived towns, where many centuries of continued occupation and blowing sands have obscured the stratigraphy. For example, at Qasr Ibrim, hundreds of spindle whorls, as well as many loom weights and several comb beaters were found in the refuse deposits and the storage pits that filled the houses along "Tavern Street" and the alley itself.[18] Nevertheless, the careful study of selected contexts of discovery at Tila and Meroe, both well preserved and documented, can be combined with knowledge on the Meroitic textile *chaîne opératoire* to offer engaging elements of interpretation.

Textile Activities on Tila Island

The rocky island of Tila was located between the Semna and Attiri rapids, offering a small and protected bay where it was possible to anchor boats during the crossing of the Batn el-Haggar Cataract. This enviable situation led researchers to identify Tila as a station on the Nilotic trading route to the Aniba basin and then towards Egypt.[19] Facing the bay, this small Meroitic settlement was located on a rocky outcrop. It was excavated by A.J. Mills and J. Knustad between 1966 and 1968, as part as the UNESCO-Sudan Antiquities Service survey, and then extensively studied by D.N. Edwards.[20] The excavation revealed a settlement surrounded by a substantial enclosure wall covering a surface of about 2.25 hectares. It contains 11 buildings or building complexes dated from the 1st century to the end of the 3rd

16 For a description of the warp-weighted loom and its use, see Barber, *Prehistoric Textiles,* pp. 91—113.

17 Kemp and Vogelsand-Eastwood. *The Ancient Textile Industry in Amarna,* pp. 358-73. See also Spinazzi-Lucchesi, *The Unwound Thread*, pp. 91—3.

18 Adams and Adams, *Qasr Ibrim: The Ballaña Phase,* p. 98.

19 Edwards, "Appendix 3. The Meroitic settlement on Tila Island."

20 I would like to express my gratitude to David N. Edwards, who generously shared the archival data regarding the site's textile manufacture and assisted in examining the archives to clarify the exact context of the tools' discovery.

century C.E. According to estimations, Tila's population remained quite limited, totaling between 56 and 102 people at a time, divided into about 20 households. Despite the small scale of Tila's settlement, an important number of textile implements were discovered scattered in the different buildings. The cross-study of excavation diaries, object inventories, and available drawings and plans, led to the localization of most of the tools and the reconstitution of their original context of use and discovery. This article will focus on four significant examples: houses VI, V, II and I.

House VI (Fig. 3)

House VI is formed by several living units and presents the same standardized house plan visible in other houses at Tila: a series of small rooms distributed around a central courtyard and directly opened to this outdoor space.[21] This architectural model, well suited to the Nubian climate, was coined by the excavators "house with loggia". A total of four bone picks were discovered in House VI: one in an open courtyard (room 9) and three scattered across the building. Two spindle whorls and two loom weights were also found in the filling. The excavation of House VI revealed several floor layers preserved *in situ*. In the northern house unit, level 1 gave us one spindle whorl and a set of three loom weights in a "loggia" type of room (room 3), open to the courtyard (room 4), while another set was found in an adjacent storage room (room 1). Level 2 gave us a second set of three loom weights, also found in a room open to the central courtyard (room 5).

House V

House V[22] continues to illustrate the use of the central courtyard for light textile work such as sewing. A long copper alloy needle was discovered in the large open space. In a small room, a bone pick was found inside a jar half-buried in the floor and containing small nail-like metal objects and a pin. This vessel was clearly used as a storage container for small, pointed objects, which could all have fulfilled similar functions.

21 Edwards, "Appendix 3. The Meroitic settlement on Tila Island," pp. 112—3.
22 Edwards, "Appendix 3. The Meroitic settlement on Tila Island," p. 112, fig. 35.

House I (Fig. 4)

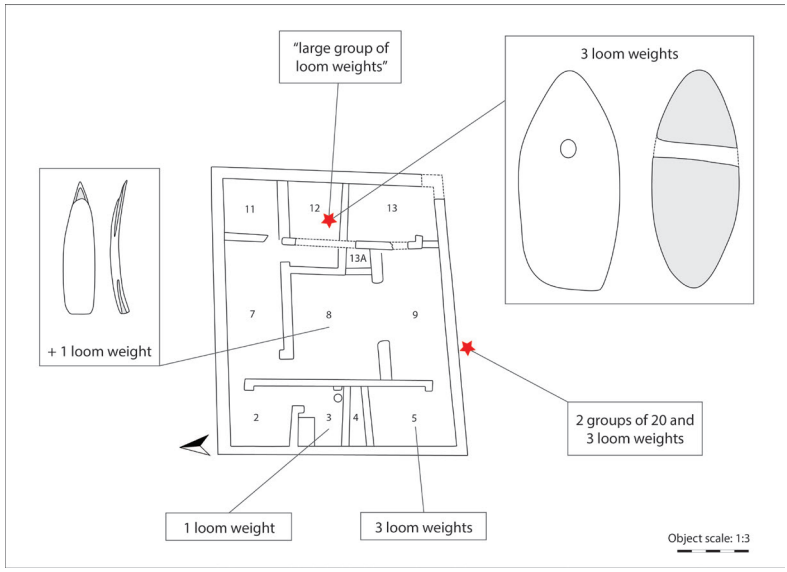

Figure 4.
Tila Island, House I: map and location of textile tools (drawings E. Yvanez. from A.J. Mills's excavation diaries, map reproduced from Edwards, "Appendix 3. The Meroitic settlement on Tila Island," p. 106, fig. 30).

The first occupation level in House I was relatively well preserved under brick rubble.[23] The structure consists of a roughly rectangular building centered around a courtyard, with a series of three utilitarian rooms along the west side for storage and cooking activities, one room on the north side, a large single room on the east side, and a possible staircase to the roof. The eastern room — the "loggia" — was most likely opened at least partially to the courtyard. An interesting group of varied textile implements was found in House I, directly *in situ* or inside the fill layers above the floors:

- House exterior, directly along the southern wall: two sets of respectively 3 and 20 loom weights.
- Central courtyard (room 8): 1 loom weight and 1 bone pick.
- Kitchen area (room 3): 1 loom weight.
- Storage area (room 5): 1 set of 3 loom weights.
- "Loggia" (rooms 12-13): 3 loom weights and another "large group of loom weights" (excavation diaries, number unspecified).

It is unfortunate not to have a precise number for the "large group of loom weights" found in the "loggia," as this information could have helped us determine the number and size of the looms that could have been working at the same time in this building. However, it is

23 Edwards, "Appendix 3. The Meroitic settlement on Tila Island," p. 106, fig. 30.

clear that the "loggia", with its protected but well-lit space, would have been perfectly suited to weaving activities. The concentration of these different types of textile tools and the possible presence of several looms in the loggia are rather striking for a small structure such as House I.

House II (Figs. 5-6-7)

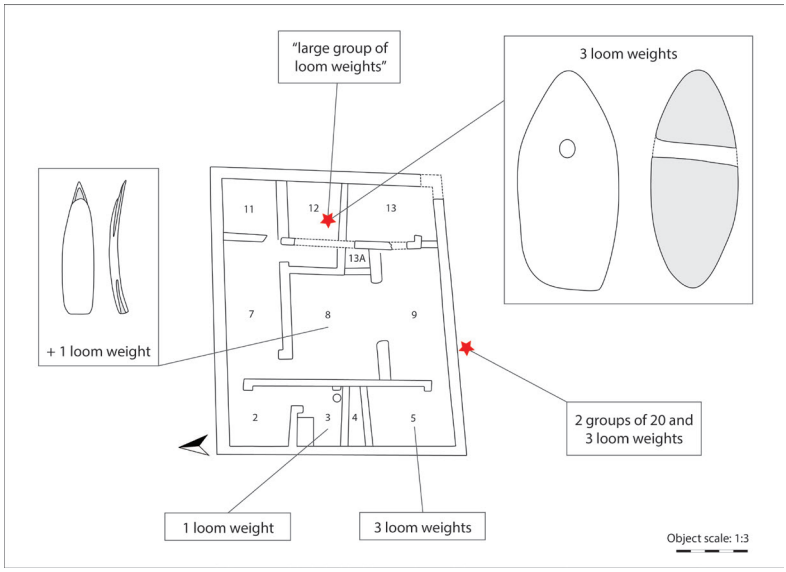

Figure 5.
Tila Island, House II: bone points (drawings E. Yvanez from A.J. Mills's excavation diaries).

House II is a building complex formed by at least nine different housing units.[24] Textile tools were found dispersed without distinction throughout many rooms and occupation levels. The inventories specifically list seven bone picks (Fig. 5), two spindle whorls, and one needle. The various locations of their discovery offer another illustration of the different kinds of storage and/or refuse contexts where textile implements can be found. In the case of House II, they appeared in the kitchen area, in a small, vaulted storage chamber, and in a storage area with jars. A group of two spindle whorls and one bone pick were also discovered discarded in a small cellar, which appears to have been used as a latrine (Fig. 6).

Besides the tools listed in the inventories, the archives also provided a very useful excavation photograph that completes the object list from House II. The image (Fig. 7) shows about 350 loom weights, all pear-shaped and made of unbaked clay, neatly arranged in small groups of about ten specimens on a sandy surface overlooking the building remains. Taken shortly after the

24 Edwards, "Appendix 3. The Meroitic settlement on Tila Island," pp. 108-11, figs. 31, 32.

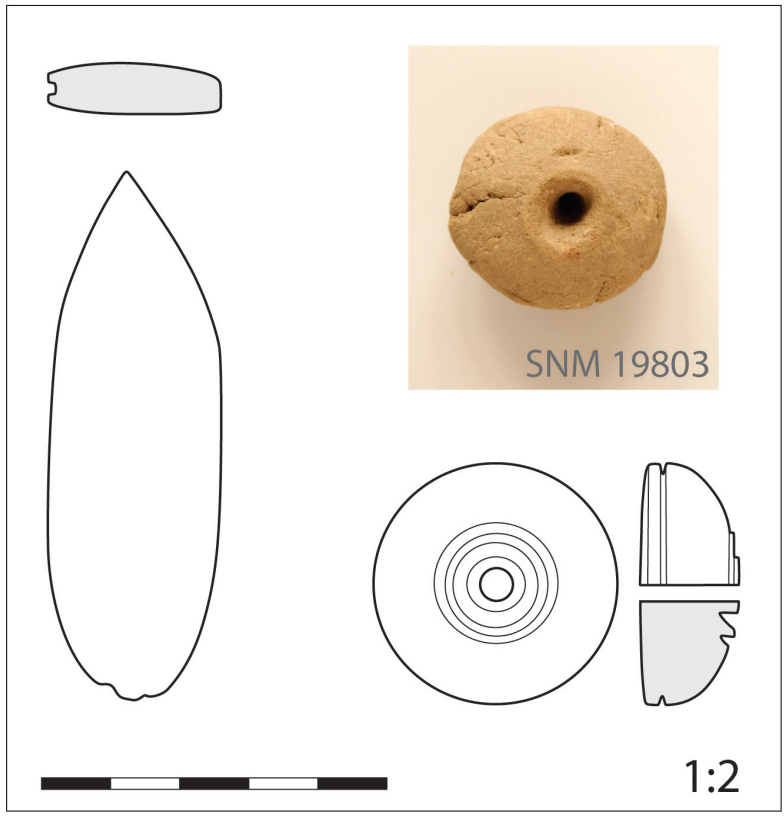

Figure 6.
Tila Island, House II: spindle whorls and bone point discarded in latrines (room 7) (photograph and drawings E. Yvanez from A.J. Mills's excavation diaries).

excavation of the complex in March 1968, the photograph (ref. F/445: 6) is captioned "House II collection of loom weights". In the present state of the documentation, it is difficult to be absolutely sure that all loom weights shown in the photograph were indeed found in House II, or if they correspond to different groups unearthed on the site since the previous year excavations (such as the "large group of loom weights found in House I") and only collected there. The caption seems however to point towards a sole discovery in House II. In any case, it seems that a very big group of loom weights was indeed found in this large complex, possibly spread around different rooms and/or occupation layers.

If we attempt to summarize the data relative to loom weights, we reach a total of at least 389 specimens, which does not include the groups of unspecified number found in Houses I and VI. To our knowledge, it is the largest group of such implements ever discovered in Sudan and Nubia.

Figure 7. Tila Island, "House II collection of loom weights" (excavation photograph ref. F/445: 6, A.J. Mills archives, courtesy of David Edwards).

As a whole, information related to textile production at Tila shows that spinning, weaving, and sewing were all practiced together within the same domestic structures. Spinning was carried out everywhere in the house, probably at the same time as other domestic activities such as food preparation. On the other hand, weaving is much more reliant on adequate positioning of the loom, sufficient space, and optimal lighting conditions. At Tila, it occurred within well-lit spaces, in the open or semi-open rooms leading to the courtyard (e.g. the "loggias") or on one occasion directly alongside the house perimeter, thereby taking advantage of the Nubian climate and domestic architecture. The looms were most likely leaning against the wall, protected from direct sunlight by the "loggia's" roof or a light structure such as an awning. When not in use, textile implements could be placed in storage and service areas often associated with culinary functions. Attested in both Sudan and other geo-historical areas, the frequent association of textile implements with remains of other household tasks, such as food preparation, led some researchers to believe that textile making must have been a primarily female activity[25] and linked it to the basic sustenance strategy of the household.

25 Gender studies have always been an important part of ancient textiles research (see for example "Women's Work", *in* Barber, *Prehistoric Textiles,* pp. 283 — 98). For a modern scholarly perspective and references, see Harlow and Nosch "Weaving the Threads," pp.

Table 1. Summary count of loom weights per structure at Tila Island.

Structure	Number of loom weights per context type
House I	House exterior: 23 Central courtyard: 1 Kitchen / storage areas: 4 "Loggia": 3 + "a very large group"
House II	c. 350
House V	None
House VI	Filling: 2 "Loggia": 3 Storage areas: set of unspecified number Room opened to courtyard: 3

However, the number of textile implements at Tila, especially associated with weaving, seems to tell a rather different story. On the one hand, Houses V and VI, with their rather limited corpus, could point towards a domestic production with no specialization of space or person. There, the scale of the production seems to have been limited, the data clearly indicating a local manufacture and consumption. On the other hand, the large groups of loom weights found in House II and presumably House I could have supplied the installation of several looms, conjointly operated by a small group of weavers working on different pieces of fabric at the same time. The production output would have increased significantly, becoming easily superior to the households' needs. The sum of this data clearly shows the importance of textile activities on Tila Island, which is particularly noticeable and surprising for such a small settlement.

Textile Activities at Meroe

Textile activities are well represented in the capital city of Meroe. The objects were mainly discovered between 1965 and 1984 during P.L. Shinnie's excavations[26] and, to a lesser extent, during earlier works conducted by J. Garstang in the Amun temple,[27] as well as recent excavations.[28] Most of the textile implements, predominantly spindle whorls, were sent to the Sudan National Museum while a smaller group joined the collections of the Petrie Museum in London. Research in those two museums, as well as through the publications and object inventories, have led to the identification of 238 spindle

10 — 11. If the link with the household is clearly established in ancient Sudanese contexts, no data pertaining to gender and a gendered differentiation of labor has come to light.

26 Shinnie and Bradley, *The Capital of Kush I*, and Shinnie and Anderson, *The Capital of Kush II*.

27 Török, *Meroe City*.

28 More spindle whorls have been discovered during Jane Humphris's excavations at Meroe for the UCL Qatar Sudan archaeological project. Found in different contexts and under current study, these objects have not been added to the present paper.

whorls, 110 loom weights, 1 needle, and 1 spool with cotton threads still attached.[29] This corpus of material forms the second largest group of textile-related tools in Sudan. Its quantity is significant but by no means very large; by comparison, the biggest corpus is estimated at about 3000 spindle whorls and comes from the southern site of Abu Geili.[30] Outside of a small group of spindle whorls and loom weights without context information, it was possible to locate most of the artefacts discovered during excavations, mainly along trenches and test pits:

Context	Number of textile tools
Ceramic ovens area inside the Amun temple's temenos (M260)	12 spindle whorls
Iron scories mound H (test pit)	7 spindle whorls 2 loom weights
Trench TT6, domestic levels	38 spindle whorls 22 loom weights 1 needle
North mound, domestic and industrial occupation levels	128 spindle whorls 79 loom weights 1 spool

Table 2. Summary of textile tools per context, Meroe.

The Meroe spindle whorls form a homogeneous group made of well-burnished ceramics in conical or biconical shapes, with the upper surface almost always decorated by incised or impressed patterns (Fig. 8). The specimens from the oven area (M260) were likely found within their manufacturing context, as they were accompanied by several other small faience and ceramic objects produced within the temple's temenos.

Mound H

The seven spindle whorls and two loom weights from Mound H belong to domestic occupation levels, built on top of several layers of iron scories, wind-blown sand, and domestic refuse. The mudbrick structures offered a number of small rooms equipped with cooking installations. In this case, the test pit seems to reveal small-scale textile production, probably linked to domestic activities, and integrated in a residential reoccupation level.

29 At the time of this study, I was unfortunately unable to locate any loom weight, nor the needle and spool, which whereabouts remain unknown. Further investigations in the site storage rooms and in the Khartoum University collections, as part of the Meroe Archival Project, might increase and precise the present list (A. Boozer, pers. comm.).

30 Yvanez, "Spinning in Meroitic Sudan."

Figure 8. Ceramic spindle whorl from Meroe-city with pattern of a sorgho plant, from oven area M260. SNM 604 (photograph E. Yvanez, courtesy of the Sudan National Museum).

Trench TT6

A similar production profile emerges from trench TT6 (Fig. 9). The majority of the tools found *in situ* belong to the oldest occupation level in two or three house buildings dated to the Early Meroitic period.[31] Scattered throughout the buildings were sixteen spindle whorls, five loom weights, and one needle, thereby attesting three of the main stages of the textile *chaîne opératoire*. For example, the house located in the I/J50 square contained six spindle whorls and two loom weights, while the neighboring building in the H/G50 square had three whorls and one weight. The other artefacts came from small residential refuse deposits, often placed in pits, or abandoned buildings, which the excavator dated to the Classic and Late Meroitic periods. These houses included many rooms and covered a significant surface that probably accommodated numerous people. It is therefore not surprising to find within their walls a great number of textile tools, accumulated by several generations. The context of textile production is still domestic, here distributed along a residential street of Meroe.

North mound

The northern part of the North mound was explored by three main trenches that revealed a dense settlement, organized into several building units separated by narrow alleys. The numerous textile

31 Focused on test pits and trenches, the methodology followed by P.L. Shinnie did not allow for the excavation of complete building structures. The objects are therefore attached to numbered "squares," making their attribution to specific houses difficult and hypothetical. For a description of excavation techniques and maps, see Shinnie and Bradley, *The Capital of Kush I*.

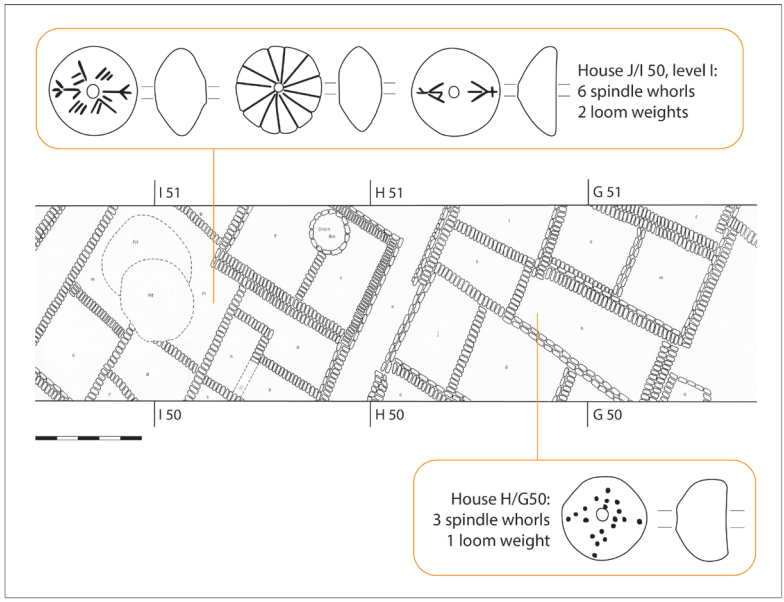

Figure 9. Meroe-city, trench TT6 between I and G 50/51: map and location of textile tools (drawings E. Yvanez, reproduced from Shinnie & Bradley, *The Capital of Kush I*, fig. 8, fig. 81-82, 216-217).

implements (128 spindle whorls and 79 loom weights listed) were discovered scattered over the different structures as well as inside intrusive layers of abandonment and refuse deposits. The results of the first excavation campaigns, along trench 79/80, provide us with the best contextual information. While many of the tools come from multifunctional areas linked to cooking and food storage, several groups of tools are associated to specific spaces.

For example, an interesting group of approximately thirty spindle whorls was discovered in a large open-air space in front of buildings II.A and II.B. Other crafts such as faience manufacturing and minor metallurgy work were also carried out on the same terrace. This particular location seems to have been used as a multifunctional public space, where Meroe's inhabitants could practice small crafts and industries. Spinning, a very portable activity, would have obviously been perfectly suited to this type of multifunctional open space. It also reminds us of the fundamental social dimension of spinning: it is a long and fastidious work, but it does not continuously engage one's attention, so it becomes easy and much more agreeable to accomplish this task while chatting or sharing small chores with other members of the community. Often interpreted as a female activity, this "courtyard sisterhood" can be observed in many populations, both ancient and modern.[32] In African cotton-producing countries, such as Mali for example, sorting cotton balls, fiber preparation, and spinning traditionally

32 Barber, *Prehistoric Textiles*, pp. 84—6.

take place in courtyards and communal spaces where women gather to share the work and exchange words.[33]

Another group of textile implements came from building I.A, in squares O79/80 and N79/80, a large structure distinguished by its peculiar internal organization (Fig. 10).[34] The building possesses an important number of small rooms, probably storage rooms, and a large L-shaped open courtyard where two spindle whorls were found. Its main feature was the construction of a hydraulic system, west of the courtyard. The structure started by a very deep well, which fed two succeeding basins connected between each other by a narrow slopping ramp, covered with waterproof plaster. Its exact function remains unknown but its sole presence indicates the industrial character of the building. A total of eighteen spindle whorls, three loom weights, and one needle was found scattered throughout the rooms, to which we can tentatively add a grinding stone fragment reused as a weight. It is very tempting to link this group of textile implements to the hydraulic artisanal installation and postulate the presence of a textile workshop with decantation vats for dyeing. Unfortunately, the stratigraphic evidence is not sufficient to pursue this attractive hypothesis any further. No traces of dyes, pigments or hearth have been reported for this specific space, therefore its use for dye preparation or leather work remains one theory amidst others. It seems clear however, that textile activities were an important aspect of the life of this building, and that they were inserted within a mixed domestic and industrial urban environment.

Discussion

Despite the geographic distance between Tila and Meroe and their fundamental difference in nature, the two settlements present a coherent image of textile production in two regions of the Meroitic kingdom. As in Tila, spinning, weaving, and sewing were all practiced together at Meroe, within the same spaces and structures, resulting in tools scattered amongst the buildings and public areas. Spinning is particularly well attested in open-air spaces (such as courtyards, streets, and alleys). As a whole, spinning and weaving were present in both domestic and industrial or semi-industrial areas.

The data from Meroe is difficult to interpret with any certainty, as the excavation campaigns differed in scale and methods. Trenches, squares, and test pits provided windows into occupation phases that

33 Picton and Mack, *African Textiles*, p. 31.
34 Shinnie and Bradley, *The Capital of Kush I*, pp. 64—5.

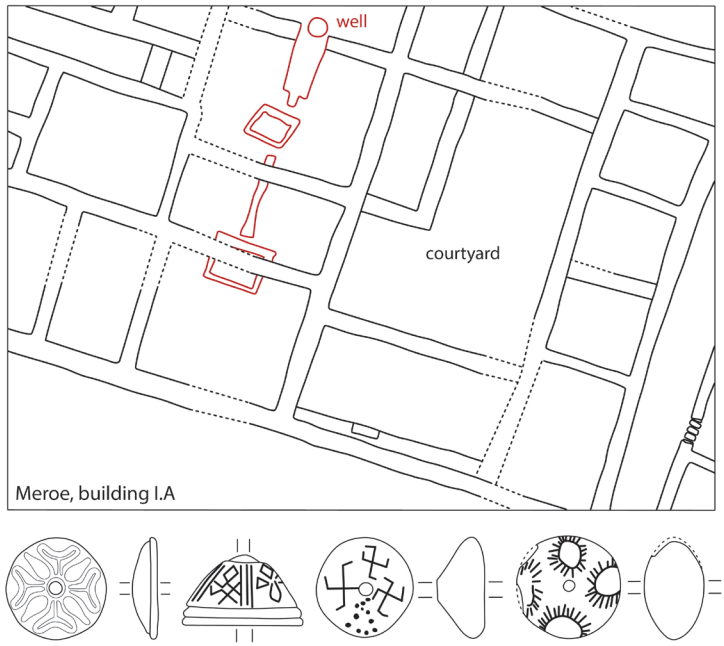

Figure 10. Meroe-city, north mount building I.A: map and location of textile tools (drawings E. Yvanez reproduced from Shinnie & Bradley, *The Capital of Kush I*, fig. 23, fig. 81-82, 216-217).

are now difficult to reconcile. Building an overall understanding of each structure remains elusive to this day. On such shaky grounds, one can only propose a preliminary hypothesis stating the existence, at Meroe, of two types of textile production. First, a limited production would have occurred in domestic residential areas to fulfill the household's needs, most probably without involving special workers or locations. The second type of textile manufacturing appears to be a small-scale industrial production taking place on the North mound, still in domestic settings or semi-industrial areas embedded in a residential neighborhood. The number of tools alone indicates a larger output of textile production, maybe a limited surplus, which may have answered the demands of the local administrative and religious elite. However, as far as we know from the available data, textile making occurred in multifunctional areas used for various crafts.

I have tried in this paper to describe the artefacts related to textile production and to assign them to clear *loci* in the Meroitic urban environment. We have also attempted to replace this production in the larger textile economy. However, it is crucial to realize that this evidence cannot be a true indicator of the scale of production

in any absolute terms.[35] If tools can help us trace different stages of the manufacturing process, many aspects of the Meroitic "textile market" remains little known, such as the question of maintenance and reuse, centralization of the production, or trade and exchange.[36] A general panorama can be drawn in broad strokes, merging different sources. It seems that textile making was organized as either a domestic activity or a small-scale industry, with a seemingly limited production output. No true textile workshop has been identified yet in Meroitic Sudan. The only location where such a production type was hypothesized is the Isis temple at Qasr Ibrim, in levels dated to the very end of the Post-Meroitic era.[37] The question of how to define a textile workshop in a Meroitic context is difficult to answer, as the current theoretical models do not apply to this type of region and socio-economic organization.[38] In the case of the Isis temple, the building did not offer a specialized space or installation, and the production was probably restricted to the temple's needs. In this framework, the involvement of the central power and religious administration in the control of textile production is still very much an open topic. Nonetheless, the creation of a cohesive and distinct Meroitic tradition (or "style") shows that textile production still obeyed a certain degree of standardization, whose agents and dynamics remain unknown. This small industry was no doubt an important one, producing luxury fabrics in cotton with blue decorations in tapestry and embroideries for the confection of elite and royal clothing.[39]

At first glance, this seems difficult to fit with the archaeological context of tools found principally in domestic contexts. In many ways, the data presented in this paper illustrates how deeply embedded textile production was in the everyday life of the Meroites. Spinning and weaving appear fully integrated in domestic spaces, either in share public areas or in the house itself, regardless of the structure's size. This proves to hold for both densely populated settlements such as Meroe or spread around compounds in more rural settings such as Tila. Furthermore, textile activities were not separated from other daily tasks, but mixed with food production and other small

35 Even in much better documented contexts, such as Pompeii, relating traces of crafts to a greater economic organization remains difficult, see Flohr, "The Textile Economy of Pompeii."

36 Yvanez, "Precious textiles"; "Clothing the elite"; and Yvanez and Wozniak, "Cotton in ancient Sudan and Nubia."

37 Adams, "Sacred Textiles"; Adams and Adams, *Qasr Ibrim, The Ballana Phase*, pp. 60—1, 129—37.

38 Spinazzi-Lucchesi and Yvanez, "Textile Workshops in the Nile Valley?".

39 For a comprehensive view of Meroitic textile technics and clothing, see Adams, "Sacred Textiles"; Wild, "Fringes and Aprons"; Yvanez, "De fil en aiguille : aspects de l'artisanat textile méroïtique" and "Clothing the Elite? Patterns of Textile Production and Consumption."

crafts. We can therefore infer that, whatever the size or economic weight of the Meroitic textile industry, it rested principally on the domestic sphere with a household-based workforce (either direct members of the family or associated retainers).

How did textile activities affect the daily life of people living in these settlements? In the absence of written accounts, we need to rely on our knowledge of the textile *chaîne opératoire* and Meroitic settlement organization to get a glimpse of the life experiences of textile craft people. The number of tools from places such as Tila, Meroe's North Mound, or Abu Geili certainly indicates that many people dedicated a vast amount of time to process fibres and threads.[40] Because spindle whorls appear in varied contexts across settlements and because spinning is a portable and time-consuming activity, we can imagine that several individuals could be seen spinning in streets and other communal spaces on a very regular basis. During the harvest season, we can also picture a heightened activity involving more people and more time, as well as installations to store the unprocessed fibres. Weaving on the other hand seems to have been attached more often to a specific domestic structure, especially to spaces open or semi-open to light and air. These courtyards or "loggias" provided an ideal environment to weave in relatively protected conditions, while still being able to interrupt one's work and tend to other tasks, such as food processing or child rearing.[41] They are also vast enough to build looms accommodating several weavers, if needed, and provided just enough space to keep a loom active while not being in the way of other people or activities. Thus, the rhythmic sounds of the loom weights and the shuttle can be added to our sensory reconstruction of the Meroitic courtyards.

However, to precise this picture and truly understand the socio-economic dimensions of textile activities, we need to learn more about who was making textiles and what output could they possibly produce. We therefore hope that new data coming from recent settlement excavations and archival work will further enhance our understanding of textile and craft activities, and the Meroitic domestic and economic landscapes.[42]

40 Yvanez, "Spinning in Meroitic Sudan."

41 Barber, *Women's Work*. Textile crafts (especially weaving) are frequently associated to mixed activities in domestic settings, from contexts and production scales as different as Roman Pompeii or Viking Age long houses, see Flohr, "Working and Living Under One Roof" and Andersson Strand, "Engendering Central Places."

42 This article was composed before the interruption of archaeological excavations caused by the war and associated rise in illegal digging. As we fervently hope for peace and for the resuming of our work in the field, this article shows the potential of re-investigating legacy collections.

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