

A textile workshop from Roman times: the *villa dels Antigons*

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Introduction

¹ PREVOSTI 2011.

² JÁRREGA and PREVOSTI 2011.

³ VALENZUELA 2010.

⁴ JÁRREGA and PREVOSTI 2013.

⁵ We thank Jaume Massó i Carballido, director of the Salvador Vilaseca Archaeology Museum in Reus, for providing access to the materials.

The Roman *villa dels Antigons*, in Reus, was one of the richest and most important agricultural concerns in the territory of the city of *Tarraco*. The farm was in operation between the second century BC and the seventh century AD. In the Imperial Age a residence was built for the owner which, to judge from the findings of the archaeological excavations – remains of a *nymphaeum* (a monumental fountain), baths, sculptures, marble and mosaics – must have been a Roman country palace. The site has been known since 1849 but it suffered large-scale damage in the 1950s; then, between 1977 and 1979, an animal feed factory was built on top of it, almost destroying it completely.

As is often the case with the finest villas of the Roman provinces, a thorough-going study of the site of Els Antigons reveals the reasons for its splendour. Many major **economic activities** have been identified¹. First, four pottery kilns have been found, which would have made amphorae for storing wine². This provides indirect evidence that the agriculture of the villa included wine production, and in fact remains of a cellar have also been found. There are also traces of iron-making, and the bones found in the excavations highlight the presence of significant level of **livestock farming**, particularly oxen³. The bone artefacts found also indicate the presence of a major textile workshop, and the name *Statutus* written repeatedly on pottery vessels has raised the possibility of a connection between the owner of the villa and the rich Tarraco jeweller *Iulius Statutus*, who was active in the third century.⁴

Textile instruments

Among the materials found in the excavations and now deposited at the Salvador Vilaseca Archaeology Museum, Reus⁵, there are many instruments made from bone: 443 pin-beaters for weaving (**figs. 1, 2 and 3**), 82 needles for sewing (figs. 4, 5 and 6), 29 fine needles without a head (fig. 7), 87 pins (**fig. 8, 9 and 10**), nine spindles (figs. 11, 12 and 13) and a spatula (fig. 14), and many other fragments

Figure 4. Needles for sewing, made of bone.



Figure 5. Needles for sewing, one made of bone, the other made of bronze.



Figure 6. Needle for sewing, made of bone, with the holes in the center.



Figure 7. Fine needle, made of bone.



⁶ For example, AGUADO et al. (2007) offer a wide range of possibilities for *acus crinalis*, although they do not mention that the term might refer to pin-beaters or to instruments for use with leather or cloth. BÉAL (1983), the study used by most archaeologists to classify bonework, categorizes flat-headed pin-beaters with a conical profile as type XX, 2, and the ones with a pyramidal head, circular section and conical profile as type A XX, 3, pins to hold hair or clothing in place. BÉAL (1983, 37) also classifies some similar specimens with flat heads (340), one with a round head (341) and another with a moulded body (342), and a relatively wide diameter as pins, inside type XVI, which he says are usually thought to have been used with leather. He gives a number of parallels found in contexts of leatherwork and dyeing. In our view, these and many of type XX, 2 and 3 should be interpreted as pin-beaters used in textiles, though they may also have been used for leatherwork.

⁷ OVID, *Met.* VI, 55 ff.; OVID, *Fasti*, III, 819; SILIUS ITALICUS, XIV, 656.

which are difficult to classify. There are also several bronze tools: two spindles (fig. 15), a spinning wheel (fig. 12) and many needles for sewing (fig. 5), and ceramic pieces: five whorls (fig. 16) and 15 *pondera* (fig. 17).

The quantities of pin-beaters and needles found clearly suggest the presence of a significant level of textile production at Els Antigons. The length of the pin-beaters varies between 55 and 113 mm. They have a wide head, a sharp tip and are robustly made. Except for four oval specimens, all are round in section and with a tapered or long conical profile, sharp at one end and wide at the other end. They all appear to have the same function. Many authors classify pieces of this kind as hairpins (*acus crinalis* in Latin) rather than instruments for weaving⁶. However, we believe that these items were too short for use as hairpins and most of them would have been used as pin-beaters in a textile workshop either in vertical warp-weighted looms or double beam looms to untie knots, to order the warp threads when they were compressed, and to pass through the warp threads and push the weft thread up or down. They may even have served as spools for the colour threads of the textile patterns on any kind of loom.

Wild (1970, 65-67) describes the instruments for the beating-up process required in vertical warp-weighted looms. These tools, made out of bone, were classified as textile instruments on the basis of findings made in British and Scandinavian archaeological contexts and on the basis of ethnographic parallels. They comprise bobbins, pin-beaters and weave combs. The tools from pre-Roman Britain described by Wild in fact resemble the pin-beaters found at Els Antigons quite closely. “The pin beaters (famous as ‘bone gouges’) are cut from the tibia or metatarsal of the sheep or goat; the shaft is cut diagonally to give a point and the butt-end may be roughly trimmed. The point would be inserted instead of the finger directly through the warp to push up the loose weft.” An equivalent tool also existed in the Roman period. “A more sophisticated version of the same tool is found after Roman conquest (table K). Both Romans and Saxons were familiar with it. Shaped like a cigar, about 10 cm. long, it is sharp at both ends, polished and round in section (fig. 16). In Scandinavia an identical object was used for pushing home the weft and rearranging the warp-threads when they became displaced. It was thrust directly into the warp from the front beneath the loose weft or drawn lightly across the face of the warp, as if the latter were the strings of a musical instrument.” (Wild 1970, 66) Wild thinks that the weavers’ pin-beaters might be the *radius* mentioned in the Latin sources⁷, and therefore they may also have been made of wood on many occasions; he also believes that they may have been used as bobbins by tapestry weavers (called brooches).

Figure 11. Spindle made of bone.

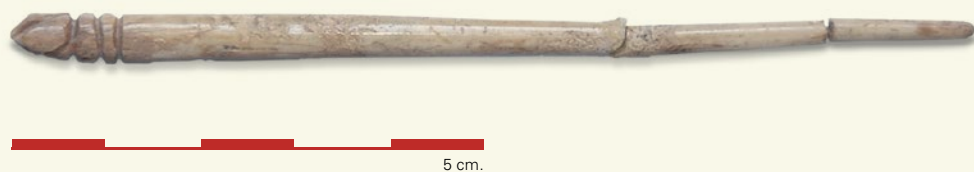


Figure 12. Spinning wheel with ring, made of bronze, and two spindles made of bone.



Figure 13. Spindle made of deer antler.



Figure 14. Spatula made of bone.



Figure 15. Probably spindles, made of bronze.



So this is the *radius* or *pin beater*, or *Schlagadel* (Wild 1970, 65-67) used for beating-up, that is, to push up the weft thread of a vertical loom. These tools are also described by Hoffmann (1964) and Ciszuk and Hammarlund (2008, 122 and 124). Moutinho *et al.* (1979, 53-54, n°s. 181 to 190) also describe *separadores*, around 100 mm long, very smooth, oval or almost circular, ending in a point, and with the function of compressing the weft thread after being passed inside the warp and to disentangle the knots of the weft thread. We think that it is the same tool, in this case identified on the basis of Portuguese ethnographic descriptions.

Figure 16. Ceramic whorls.



Figure 17. Pondera (weight of loom), ceramic, with mark.



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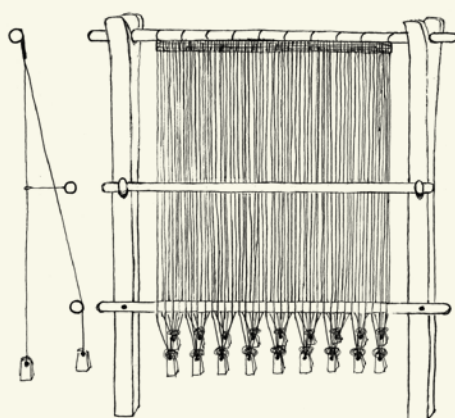


Figure 18. Vertical warp-weighted loom.

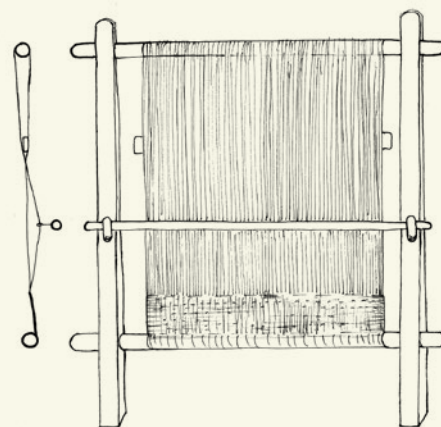


Figure 19. Vertical double-beam loom.

⁸ See, for example, the Attic lekythos by the painter Amasis, 550-530 BC, in the Metropolitan Museum of Art. See also fig. 26, CLELAND *et al.* 2007, 117.

Probably the thickest pins found in Els Antigons would also have served as textile pin-beaters and were not used as hairpins. On the other hand, the longer thinner ones would have been used in the hair, but probably also for other uses as well, among them applications in the processes of textile production. The narrower needles and the sewing needles would also have had their own function in the workshop. The needles made of bone with a hole in the tip to allow the thread to pass through often have quite wide holes, which would not have been practical for sewing. We think that they may have been used in the weaving process, to prepare the warp and the first stage of the weaving in the vertical looms, to finish the woven pieces, and to correct defects. In fact, similar needles made of wood are still used in Scandinavia to make a type of fabric which dates from medieval times using a knotless pulling-through technique called Nalbindning to weave socks, gloves, hats and scarves.

The tools described here are just a sample of all the ones that would have been used in the workshop. As we said above, most of the instruments were made in wood, a material that does not survive over long periods of time. Nor do any traces of the looms remain. So these humble bone tools, the pin-beaters and needles used by the weavers and tailors in their work, are extremely valuable for identifying the textile activity in the Roman era. Unfortunately they have often not been correctly identified in archaeological studies.

The looms

In Roman times, for the most part two types of looms were used: the vertical warp-weighted loom (fig. 18) and the vertical double-beam loom (fig. 19). The first type was already known in Iberian and Greek cultures, and appears depicted on Greek vases⁸. The warp was tensed with weights hanging vertically, tied to the end of groups of threads. In the middle of the loom there was a rod. The loom might be very wide to produce large cloths without having to sew them together. In fact Roman robes required little dressmaking, since they were ready for wear when they came off the loom. The weaver worked standing, walking from one end to the other, passing the weft through small groups of warp threads and pushing it upwards. In this movement the pin beater was used, as well as the comb and the cutter. The cloth rolled around the upper beam.

9 Quoted by HUMPHERLEY et alii 1998, 364: "The most essential equipment for use on a daily basis has already been discussed. In a few words one can pull together the rest of those items that pertain to the women's quarters: woven baskets and baskets with narrow bottoms and the smaller types of both, the *onos* upon which they spin and the *epinetron*, and the spindle and the circular whorls, the skeins of yarn, the weaver's shuttle and the comb of the loom; and the upright loom as well as the side beams of the loom; and the weaver's rod [to attach the alternate threads of the warp] and the beam along with the vertical beams of the loom [between which the web hangs down] and the long beams of the loom [between which the web is stretched]; and the stone weights [for the warp threads] and the loom weights, and the flat blade [to strike the woof threads home]".

10 WILD (1970, 75-76), in his description of Roman horizontal looms, describes the specimen found in situ at *Herculaneum* (MAIURI 1958, 463, fig. 420), which had four loom weights at the ends, which would have tensed the warp, hanging from the four corners of the loom. However, it was so badly burned that the author does not think its workings can be understood.

11 ALFARO 1984, 53-55; GLEVA 2004.

The vertical double-beam loom was a technical improvement introduced in the Roman era. Basically, in this new instrument, the warp was tensed between two wooden beams. This system allowed the weaver to sit in front of the cloth and to begin in the lower part; the cloth rolled around the lower beam. The heddles were introduced once the warp was mounted, and were tied with the aid of cords (Ciszuk and Hammarlund 2008, 124-125). The pin beater was also used.

Wild (1970, 71-72) explains that technical details of the vertical double-beam looms became known through Coptic tapestries. In the introduction of the colour weft to make decorative designs, the weaver separated the warp threads with the fingers to open the shed and passed the weft through it, sometimes selecting some of the warp threads. Then, the weaver pushed the weft with the tip of the bobbin, the *radius*, which is used as a pin-beater. So, in the vertical double-beam looms, although in the plain part of the tapestry or cloth the weft was pushed with a comb, in the decorated areas it was pushed with a pin-beater.

Seneca (*Epistles* 90. 20), in the mid-first century AD, considers that a vertical double-beam loom is a more sophisticated instrument (*subtilus genus*) than a vertical warp-weighted loom. These looms were already known in Italy before the Common Era, and in fact they had been in use even earlier in Egypt and Scandinavia. According to Wild (1970, 67), vertical looms quickly gave way to double-beam looms. Nonetheless, in the second century, Pollux (*Lexicon* 10.124-125)⁹ still describes vertical warp-weighted looms, so the classical sources suggest that the two types coexisted over a long period.

There are very few references to the Roman horizontal loom¹⁰. This instrument can only be studied indirectly, that is, via a dozen silk damasks found in tombs and reliquaries from the late Roman Era. It appears that the horizontal loom with two (and later more) shafts was already in existence before the end of the third century, although it is more frequently found in the fourth and fifth centuries. We know it was in use in the eastern Mediterranean, in Syria and Turkey, where fine materials arrived from China via the Silk Route. But some damasks have been found in the Western Empire, and conceivably this more developed technology also reached the West (Wild 1987). So the textile workshop of Els Antigons, on the strength of the archaeological evidence which can be dated to the third century, may already have had horizontal looms, even though the work was probably carried out on vertical looms.

The classical sources indicate that *Hispania Tarraconensis* had some important precedents in the production of linen during the Iberian Era¹¹. Polybius (*Hist.* 3.14.4) and Livy (22.46.6) note that the Iberians in Hannibal's army wore short linen tunics. Strabo (3.4.9) reports the existence of important *linourghia* in *Emporium*, where raw fibre was converted from the plant *linum*

¹² Linen production was widespread in the pre-Roman world: see GLEVA (2004).

¹³ GLEVA 2004.

¹⁴ MAIK 2004.

¹⁵ WILD 1970, 2003; CARDON 1999, 2003; BORGARD and PUYBARET 2004.

usitatissimum into yarn and cloth. Analytical tests find traces in the pools where the plants were left to decompose.

In the Roman Era this tradition continued and developed. Pliny (*Nat.* 19.10) describes the linen made in Tarragona as the finest and whitest in the Empire. “But it is the province of *Hispania Citerior* that produces a linen of the greatest lustre, an advantage which it owes to the waters of a stream which washes the city of Tarraco. The fineness, too, of this linen is quite marvellous, and here it is that the first manufactories of cambric were established”. This text suggests that along the Francolí there would have been meadows where cloths were whitened, as well as a major textile industry. The looms where these products were made were probably vertical double-beam looms; the weaves required for the linen cloth were straightforward, and horizontal looms would not have been necessary.

The villa of Els Antigons is located precisely in the area mentioned by Pliny. The inscription *RIT 9* (Alföldy 1975; Panosa 2009), dates from the Late Republican Era and is written in Iberian and Latin. It seems to refer to a Romanized indigenous woman who, to judge from her name, *FVLVIA. LINTEARIA*, would have been a weaver or trader in linen.

This is another example of the thriving linen industry around *Tarraco*. Linen production seems to have derived from an indigenous tradition; it developed during the Republican period¹² and survived and flourished under the Empire, as we read in Pliny the Elder. The classical sources¹³ suggest that linen was used for clothing and household articles and also to make sails for boats or *velamina* (or veils) for buildings for public spectacles, and other minor uses, such as filters for food, in medicine, and so on.

The production of hemp and especially of wool is often mentioned in the classical sources, among them Cato, Varro and Columella. In the Roman Era the wool was of excellent quality, perhaps not even surpassed by the best merino wool from Australia and New Zealand today¹⁴. In the Ancient World¹⁵ it appears that wool was usually dyed and then woven on vertical looms like the ones described here, using the same tools. So these looms may indicate the production of either linen or wool, or hemp, or other fibres as part of a manufacturing industry that must have been one of the villa’s most important economic activities. ●

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FIGURE 1. PIN BEATERS FOR WEAVING, MADE OF BONE.
Figura 1. Punxons de teixir, fets d'os.



FIGURE 2. PIN BEATERS FOR WEAVING, MADE OF BONE.
Figura 2. Punxons de teixir, fets d'os.

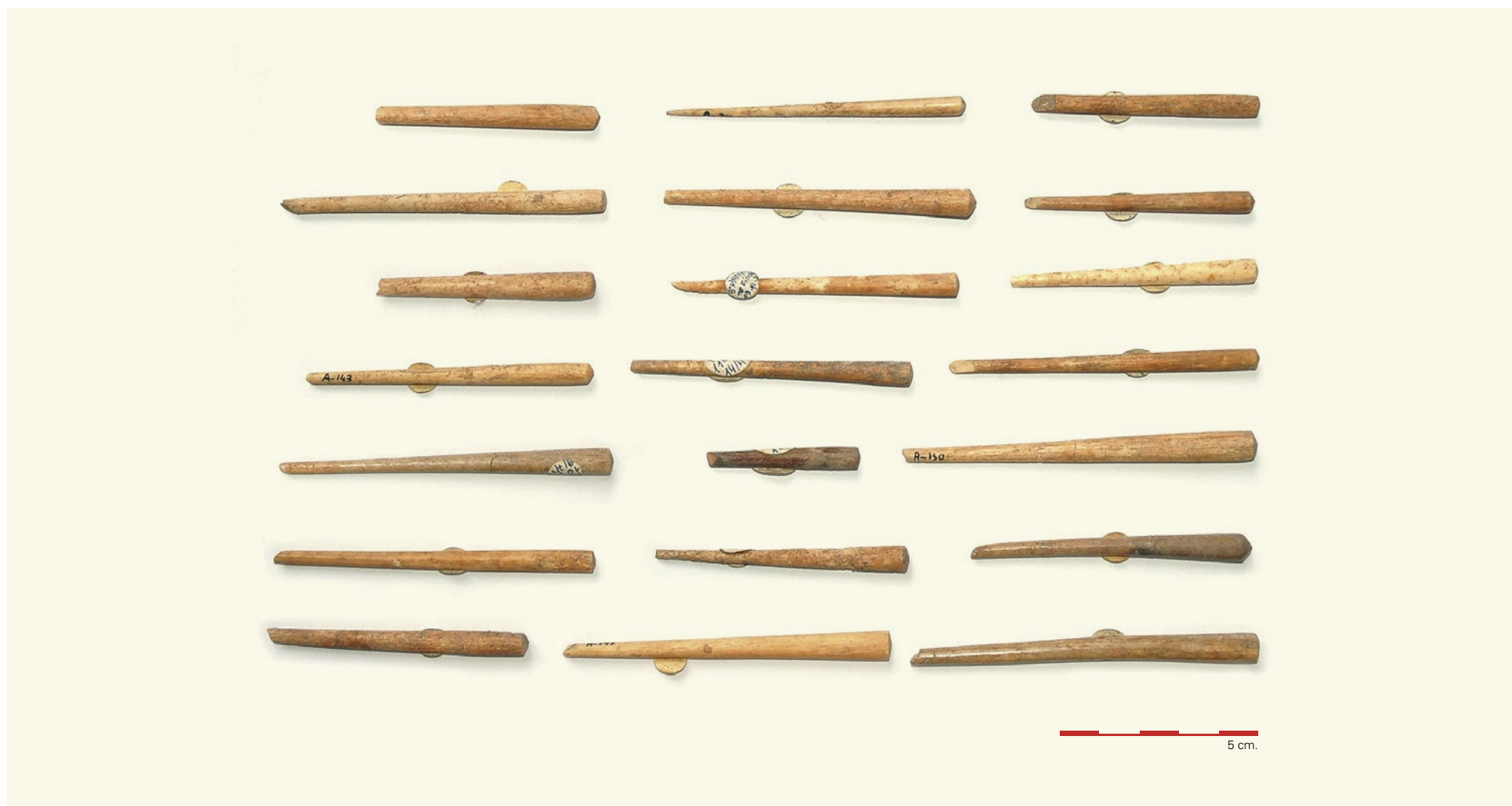


FIGURE 3. PIN BEATERS FOR WEAVING, MADE OF BONE.
Figura 3. Punxons de teixir, fets d'os.



FIGURE 8. PINS WITH ROUND OR CONIC HEAD, MADE OF BONE.
Figura 8. Agulles amb cabota rodona o cònica, fetes d'os.



FIGURE 9. PINS WITH ROUND OR BUTTON HEAD, MADE OF BONE.
Figura 9. Agulles amb cabota rodona, abellanada o de botó, fetes d'os.



FIGURE 10. PIN WITH BUTTON HEAD: ACUS CRINALIS, HAIR PIN.
Figura 10. Agulla amb cabota de botó: *acus crinalis*, agulla pel cabell.

