

Scourge bloodstains on the Turin Shroud: an evidence for different instruments used

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Abstract

Scourging bloodstains on the Shroud of Turin have always been grouped together without distinction.

Image processing and contrast enhancement of the 2000 Gian Durante photos allowed distinction of three different types of scourge marks.

The first type is the most evident and it can actually be associated to the use of a Roman flagrum similar to that usually mentioned by Shroud researchers. It is characterized by two or three brown-to

-reddish circlets (probably where the sheet has been more soaked by the blood) connected by a lesser evident small bar.

The second type is more evanescent but more numerous. It has a wider shape and it appears to be formed by parallel pale brown-to-reddish lines fading into the body image colour.

The third type is very faint and it is detectable only on legs (especially on their lower part) and calves. It is a kind of fan-shaped scratch.

Processing and comparisons between the three types of scourge marks support the hypothesis that these traces can be attributed to the use of different kinds of torture instruments.

Introduction

The world-wide known and controversial Shroud of Turin (TS) is an ancient linen sheet 4.4 m long and 1.1 m wide bearing a faint double imprint of a man covered with the signs of numerous wounds, traditionally referred to crucifixion. Some of the red traces characterising these wounds have been analysed both in 1978 during the STURP (Shroud of Turin Research Project) and by the Italian forensic pathologist Baima Bollone and they resulted human blood (Heller & Adler 1980; Baima Bollone et al., 1981, 1982; Heller, 1983), transposed on the cloth by fibrinolysis (Adler 1996, Brillante 1983). The bloodstain characteristics are peculiar and have been coded for every one who wants to try a laboratory reconstruction of the TS (Brillante et al., 2002).

Among all the bloody traces those which have always been ascribed to scourging are outstanding but still somehow the less investigated. These marks can be found over the entire body surface but they are more evident and better shaped on back area, chest and legs. To the

naked eye they appear as small round, single to double imprints; few of them seems to be tailed by a sort of scratch which is much more evanescent, whereas in the majority of cases the round imprints are not present, and the whole track is similar to an elongated furrow. They normally cross cut each other, as brushstrokes on a painting, and are overlapped by other blood marks (for example the “blood belt” and the outflows from wrists), indicating that they preceded other tortures in the temporal sequence of the execution (Fig. 1). Experimental reproduction of scourge marks on a living being has not obviously been done and it is still unknown how similar wounds (defined as “laceration-and-bruise wounds” by Baima Bollone, 1990) can dirty a linen sheet. In addition, although some marks have the same colour of blood from other areas (Bedon et al., 2008), the scourge stains have not been analyzed and whether they are blood or part of the body image is still uncertain (Fanti, 2008). Connecting these traces to a kind of whipping is easy and immediate even for an observer which is not a medical expert, and it has been historically “forced” by the traditional interpretation of the TS as the burial cloth of Jesus. Moreover, the use of whips (*sensu latu*) as a form of torture during trial interrogations and/or as a part of capital punishments has always been documented by historian reports and archaeological finds in the whole ancient Mediterranean and Middle East. For this reason, still, finding out which kind of instrument/s and among what population it/they has/have been used in the case of the Turin Shroud man (TSM) is quite complicated. Moreover, the variety of torture instruments created through centuries is wide and straightforward.

In the first half of 1900 Paul Vignon tried to experimentally prove that the TSM underwent a Roman scourging. He made up a scourge, on the basis of both direct observations on the TS and historical chronicles, consisting in a wooden handle with three leather stripes each of them ending with a dumb-bell-shaped lead weight. This scourge was then hit onto a wooden target covered by corrugated cardboard, to simulate skin. Marks left in the mannequin had a strict similarity with those observed on the TS (Vignon, 1939). During the century-lasting TS research history many others investigators confirmed Vignon’s findings; among them the most important and productive has been doctor Pierre Barbet, who first reconstructed the lethal sequence of the TSM from trial to crucifixion (Barbet, 1954). In the 80ies G. Ricci gave another important contribution to scourge marks understanding. He made a systematic visual study on a 1:1 scale copy of the TS obtained from the 1931 Enrie photographs, which had been realized with an orthochromatic film in order to enhance all details. Starting from Barbet’s conclusions that the TSM had been scourged by two executors, he was able to figure out that they were placed on each side of the body, armed with a similar instrument, again identified with a Roman “flagrum”, a whip with two or three leather straps ending in dumb-bell shaped metal spiky spheres or animal bones (Ricci 1989). His work went so further that he tracked the way and dip of each blow (counting up to 120) and hypothesized that the TSM had probably been tied by the hands to a low pillar during scourging.

The real limit of these efforts relies on the use of simple naked-eye observations of the TS image. Not all scourge marks are well featured, they are faint and often overlapping and have a colour so similar to that of the body imprint, that it is very difficult to achieve an objective discrimination between scourging traces and what can be considered as “blank” noise.

The total amount of lashes and the specification of the full mark of the torture instrument(s), are very difficult to identify and the various reconstructions of TSM scourging performed until now are probably based more on personal interpretation than by the use of true, accurate data from the TS, as also stated by Baima Bollone (1997).

Many other forensic experts tried more recently to improve the understanding of the TSM whipping, but they focused mainly on its medical aspects (among them Baima Bollone 1992; Coppini 1992; Zugibe 2005) and on its consequences in the context of the lethal sequence of execution (Larato, 1984; Foddai, 1989; Baima Bollone, 1999), instead of extracting more and more information from the TS image.

This preliminary work is based on the study of scourge marks using a computerized processing of the TS image, in order to enhance these particular traces and obtain a better and objective visualization, thus allowing an accurate reconstruction of the impacting tool/s. This information will be useful both for scourging reconstruction and for its spatial-temporal placing in history.

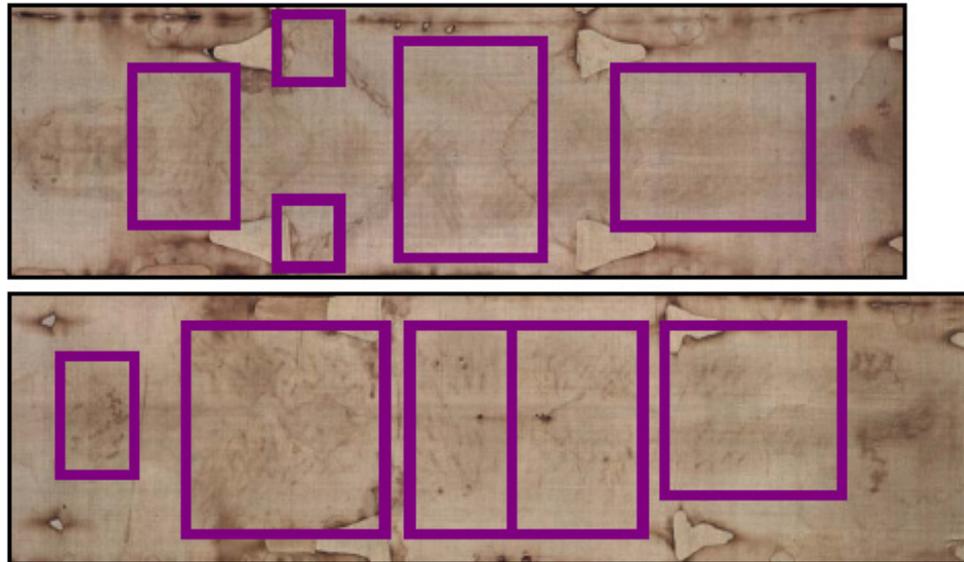


Fig. 1: Turin Shroud man dorsal and frontal images. Violet frames show the areas where image processing has been performed.

Scourging in Roman times

The punishment of flagellation was much in vogue in ancient times and especially among the Romans; and it was the common chastisement which judges inflicted upon offenders, especially upon those of a servile condition. Surrounded by an apparatus of whips, scourges, and leather straps, they terrified offenders, and brought them to a sense of their duty.

Judges among the Romans used a great variety of instruments for inflicting the punishment of whipping. Some consisted of a flat strap of leather, and were called *Ferulæ*; and to be lashed with these *Ferulæ*, was considered as the mildest degree of punishment. Others were made of a number of cords of twisted parchment, and were called *Scuticæ*. These *Scuticæ* were considered as being a degree higher in point of severity than the *Ferulæ*, but were much inferior in that respect, to that kind of scourge which was called *Flagellum*, and sometimes the *Terrible Flagellum*, which was made of thongs of ox-leather, the same as *carmen* used for their horses. We find in the third satire of the first book of Horace, a clear and pretty singular account of the gradation in point of severity that obtained between the above-mentioned instruments of whipping. In this satire, Horace lays down 11 the rules which he thinks a judge ought to follow in the discharge of his office; and he addresses himself, somewhat ironically, to certain persons who, adopting the principles of the Stoics, affected much severity in their opinions, and pretended that all crimes whatever being equal, ought to be punished in the same manner. "Make such a rule of conduct to yourself (says Horace) that you may always proportion the chastisement you inflict to the magnitude of the offence; and when the offender only deserves to be chastised with the whip of twisted parchment, do not expose him to the lash of the horrid leather scourge, for that you should only inflict the punishment of the flat strap on him who deserves a more severe lashing, is what I am by no means afraid of." The choice between those different kinds of instruments, was, as we may conclude from the above

passage, left to the judge, who ordered what instrument should be used; and the number of blows was likewise left to his discretion; which sometimes were as many as the executioner could give. "He (says Horace in one of his Odes) who has been lashed by order of the Triumvirs, till the executioner was spent." Besides this extensive power of whipping exercised by judges among the Romans, over persons of a servile condition over aliens, and those who were the subjects of the republic, masters were possessed of an unbounded one with regard to their slaves, over whose life and death they had an absolute power. Hence a great number of instruments of flagellation, besides those above mentioned, were successively brought into use for punishing slaves. Among those were particular kinds of cords manufactured in Spain, as we learn again from a passage in an Ode of Horace. A number of other instances of this practice of whipping slaves, as well as other different names of instruments used for that purpose, may be found in the ancient Latin writers, such as Plautus, Terence, Horace, Martial, & co. So prevalent had the above practice become, that slaves were frequently denominated from that particular kind of flagellation which they were most commonly made to undergo. Some were called Restiones, because they were used to be lashed with cords; others were called Bucædæ, because they were usually lashed with thongs of ox-leather; and it is in consequence of this custom, that a man is made to say in one of Plautus' plays, "they shall be Bucædæ (that is to say, scourged with leather thongs) whether they will or no, before I content to be Restio," or so much as beaten with cords. And Tertullian, meaning in one of his writings to express slaves in general, uses words which simply signify "those who are used to be beaten, or to be discoloured with blows." But, besides all those instruments of flagellation used for punishing slaves, which have been mentioned above, and as if the terrible flagellum had not been of itself sufficiently so, new contrivances were used to make the latter a still more cruel weapon; and the thongs with which that kind of scourge was made, were frequently armed with nails, or small hard bones. They also would sometimes fasten to those thongs small leaden weights: hence scourges were sometimes called Astragala, as Hesychius relates, from the name of those kind of weights which the ancients used to wear hanging about their shoes. Under the tortures which those different instruments inflicted, it was no wonder that slaves should die; indeed this was a frequent case; and the cruelty grew at last to such a pitch, that a petition was made in the Council of Elvira to restrain it.

It is important to underline that only the Roman law did not have any restriction on the number of lashes to be delivered in case of death penalty, whereas the majority of other Mediterranean populations, like for example Egyptians and Greeks, had. Among the Jews only 39 lashes could be delivered (Zaninotto, 2000).

Scourge mark types

Almost the whole surface of the double human image on the TS is covered by those marks which have universally been referred to scourging (Fig. 1). They are particularly evident and numerous in chest, back, buttock, leg and calve areas whereas they are fainter elsewhere, for example on belly and back of knees, where the contact between the body and the sheet was absent or poor, as demonstrated by Fanti et al. (1999) and Basso et al. (2000). In the dorsal imprint they are better defined but somehow flattened on back, shoulders and buttocks, due to body weight. No information is available from both right and left sides, whose imprints are lacking on the TS due to its wrapping configuration.

Image processing of areas in the frames of Fig. 1 have been performed, in order to enhance scourge marks. Adobe Photoshop 7.0 and different supplementary image filters were used on a high resolution scanning of the Gian Durante 2000 photographs of the TS.

First, TSM image has been cyclically smoothed to reduce noise and enhance the contrast between background colour and scourge marks. All body zones have been processed, but the

results in areas outside the violet frames of Fig. 1 could not be easily interpreted and have been discarded, as scourge marks are too faint and not well differentiated from background noise. The knees in the frontal image also did not return any pattern having reference to scourging. Each selected area then has been filtered and colour has been tuned (filter mehdi “contrast balance”) to obtain a darker shade and a better shape visualization for scourge marks.

=> Noise – despeckle => mehdi - contrast balance

Then, three different kind of wound has been identified after further image processing, as will be shown below.

“Type 1”

Type 1 is the most evident scourge mark. Its shape is easily recognizable even to the naked eye and it is universally known by TS experts (Fig. 2A). It consists of two small round marks connected by a little trail (called “dumb-bell-shaped” by TS medical experts), attributed to the damage of Roman flagrum ending parts. To refine its shape, an additional image processing has been done on each single mark, in order to define its contours, using the filter “thorn edges”. This filter varies image balance, smoothness and contrast and groups together pixels of the same colour, transforming the input information into a black and white image. After this second step, most of Type 1 scourge marks appear similar to example in Fig. 2B.

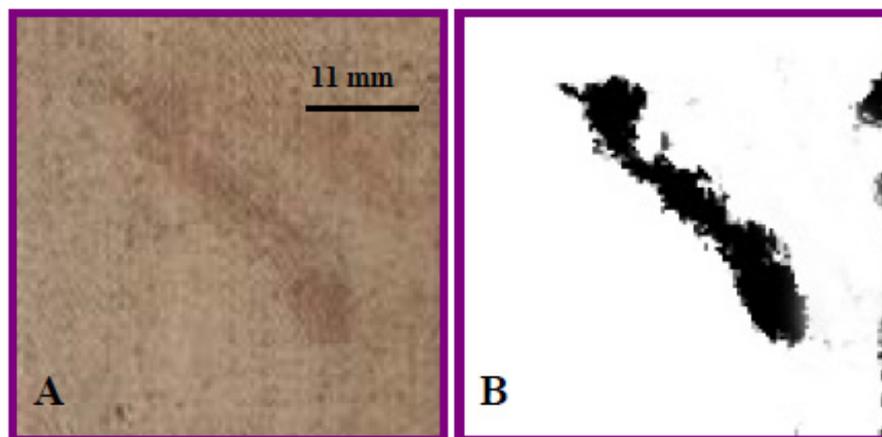


Fig. 2: Most common Type 1 scourge mark. A: as seen on the TS; B: after image processing to define its contours.

A minor amount of signs, however, gave a different output. They revealed a slightly smaller (15%) but similar impacting object made of three aligned spheres (Fig. 3C, D). There is no need to think about a different kind of whip in this case, because this is probably only an apparent discrepancy.

The most common mark (Fig. 2A, B) can be due to the same instrument that gave the other imprint (Fig. 3A,B), but the trace of the third metal ball is blurred, because this left a trail rubbing against the skin when the whip was pulled back. In this case it is probable that scourge marks are also slightly bigger, because the heavy extremities penetrated deeper and maybe with greater strength into the skin, giving rise to a wider wound. Also, an impacting angle less orthogonal with respect to the skin surface could be responsible for Fig. 2 scourge marks.

Therefore, although not very common on the TS, Fig. 3 Type 1 scourge marks can better highlight the shape of the flagrum extremities.

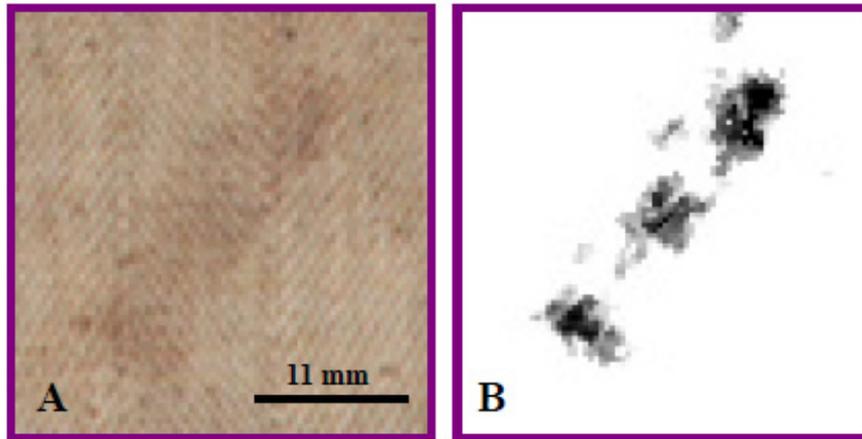


Fig. 3: Rare Type 1 scourge mark. A: as seen on the TS; B: after image processing to define its contours.

“Type 2”

Type 2 is the most diffused scourge mark, but it is too faint to be correctly perceived observing the TS, especially at short distance and/or high magnification. It consist of large striped bands (10 - 15 mm wide) of varying length (somewhere reaching 7-8 cm, for example on shoulders and upper back area) similar to deep scratches (Fig. 4 A, B). It can not be linked to the same whip responsible for Type 1, and a different kind of image processing has been used to enhance this kind of mark.

Filter “medhi - contrast balance” (enhancing contrast between colours) plus filters “sharpen edges” and “sharpen more” have been iteratively applied. The results are shown in Fig. 4C, D.

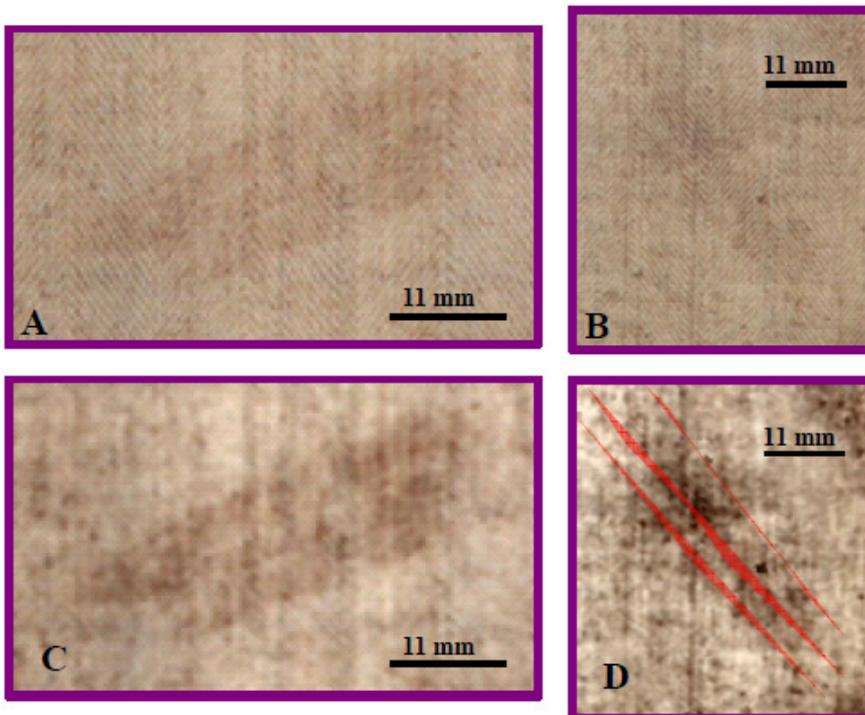


Fig. 4: Type 2 scourge marks. A, B as seen on the TS; C, D after image processing to define their contours. In D red lines help visualize the shape; on the upper right side part of another Type 2 mark is visible.

“Type 3”

Type 3 is very rare (it occurs less than 15 times) and much more faint. It is found on legs (in both frontal and dorsal image), calves and close to the ankles. It consists of a fan composed by 3 - 4 thin curved stripes (Fig. 5).

To enhance these marks, both kinds of image processing previously applied to Type 1 and Type 2 have been used. The resulting form is shown in Fig. 5 B, C, being somehow similar to a garden rake.

This mark is probably derived from Type 2, as will be discussed below.

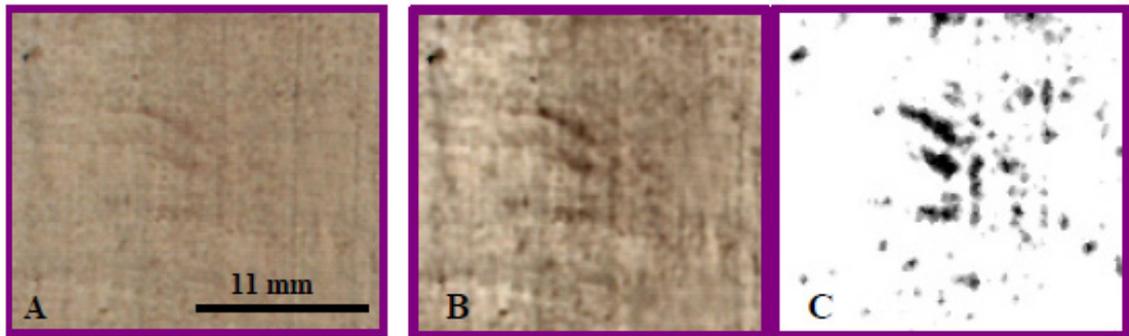


Fig. 5: Type 3 scourge mark. A: as seen on the TS; B: after image processing used for Type 2 marks; C: after image processing used for Type 1 marks.

Relationships between scourge marks

Type 2 mark was already noticed by some Authors, for example G. Ricci (1989), who charged them to the graze left by flagrum straps. Nevertheless not all Type 1 marks have a “tail”, as it will be possible to notice in detail below, nor the great majority of Type 2 marks terminate in a Type 1 sign. The flagrum ending parts impact first and impede to the straps to come in contact with the skin, unless they wrap around curved body surfaces, and this would happen mainly on body sides, considering the position of the executor/s with respect to the prisoner. If Type 2 marks were due to the flagrum leather straps they would not occur in the centre of the body; on the contrary they are almost equally distributed over all body surface. Moreover, there are numerous evidences that Type

1 randomly overlaps Type 2, as will be shown in the following sections.

The temporal sequence Type 2 – Type 1 is recognizable from the fact that Type 2 marks in no way disturbed Type 1. If Type 2 came after, indeed, Type 1 would appear smeared, due to deformation of the wound by the scratches of the other whip. After image processing, on the contrary, Type 1 has always a contour that is quite sharp, and its local bleeding always covers Type 2 trace when the two types of scourge marks cross cut each other (Fig. 6A).

In Fig. 6 a typical example of overlapping is shown, found in the right leg of the dorsal image. Type 2 scourge mark comes first, then Type 1. Following the leg contour, Type 2 has a convex shape. Sketch of overlapping relationships is added for clarity in Fig. 6B.

Other examples can be found especially on the back in the dorsal image, where scourge marks are numerous, as will be possible to see in Fig. 7, but also on chest and other areas of legs (see below).

It can be deduced that Type 1 and Type 2 scourge marks are not related to the same torture instrument, but must have been left by different whips in different moments during scourging. Whip leaving Type 2 marks has been used first, then whip leaving Type 1, which is most probably the already mentioned Roman “flagrum” having two or three leather straps

with three aligned metal spheres or bones at each end.

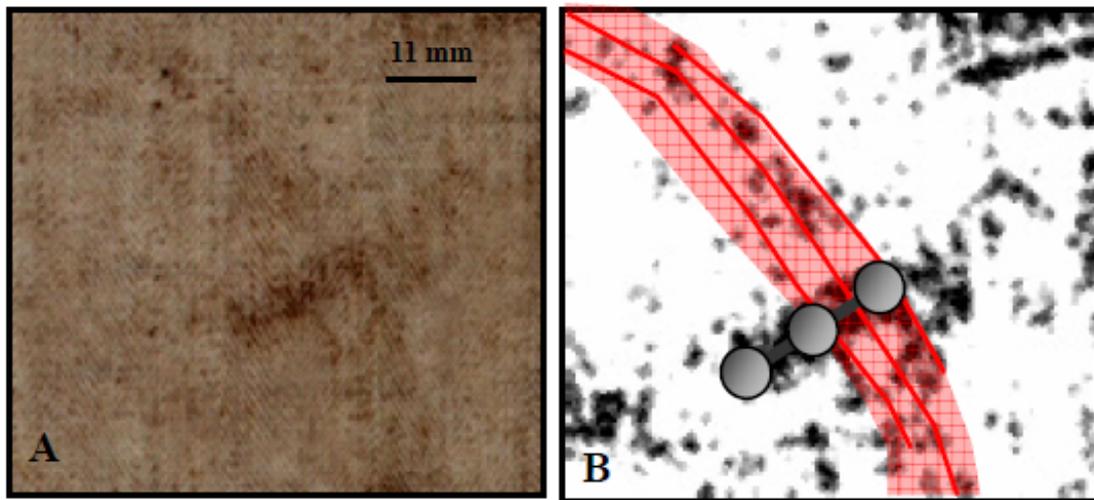


Fig. 6: Overlapping of Type 1 mark on Type 2 from upper legs in dorsal image, after different kinds of image processing. In B a simple sketch of the two scourge marks is added to help visualize the overlapping. On the right upper side of the picture, part of another Type2 scourge mark can be seen.

Dorsal Image: back area

In the back area Type 1 and Type 2 scourge marks are evident and crowded, and the overlapping of these two kinds is particularly evident everywhere (Fig. 7).

Image processing gave good results on about 70% of the selected area, but in some cases the scourge marks, especially Type 2, were too faint to obtain a neat image. The blows are almost equally distributed on the whole surface, for both kind of whips, but Type 2 are more numerous than Type 1. Scourge marks are better defined in the central part of the frame, where contact between linen and skin was better, due to the weight of the corpse. On shoulders, wrapping of the sheet around the body resulted in a bending of Type 2 marks. Marks are fewer and their definition is worst toward the lumbar region, where there was little or no contact with the sheet because of the S shape of the spine, maintained by rigor mortis (Basso et al., 2000). In the smaller frame of Fig. 7 the reconstruction of resulting blows is shown.

Only blows clearly singled out are represented, as they probably are more numerous but it was impossible to obtain a good image over the noise of the body image. For this reason an accurate count is impossible, but in any case they certainly exceeded the only 39 lashes that would have been allowed by a Jewish tribunal (Zaninotto, 1984, 2000).

Areas of large overlapping of the two kinds of scourge marks are indicated within yellow circles.

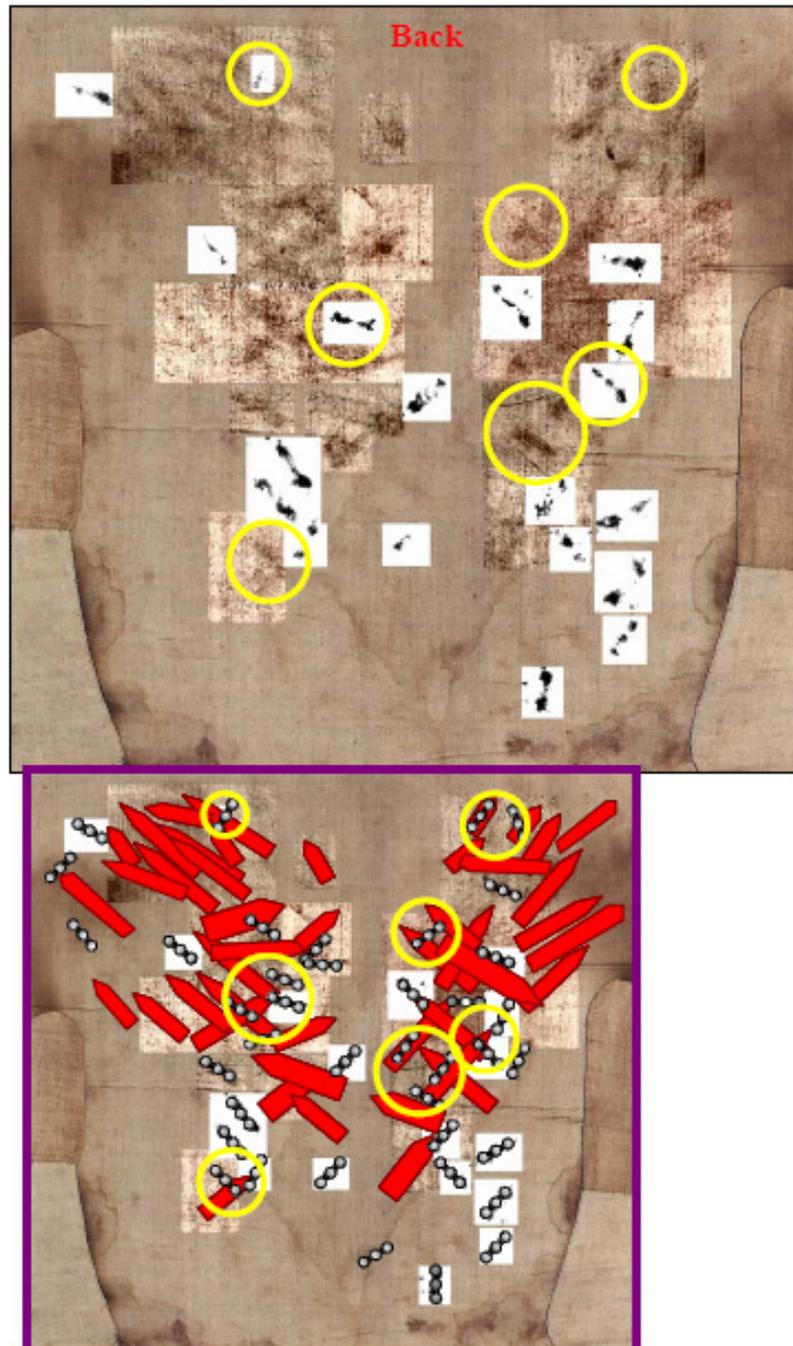


Fig. 7: Image processing of scourge marks on back area. Reconstruction of some blows on the smaller frame. Overlapping between Type 1 and 2 in yellow circles.

Dorsal Image: buttock and leg areas

A similar situation is found in buttocks and back of legs areas (Fig. 8). Here, some Type 1 blows caused remarkable bleeding that completely soaked the linen. Sheet banding effects are particularly evident (highlighted with dotted lines in Fig. 8) and should not be confused with scourging marks. Overlapping of Type 1 on Type 2 is shown within the yellow circles.

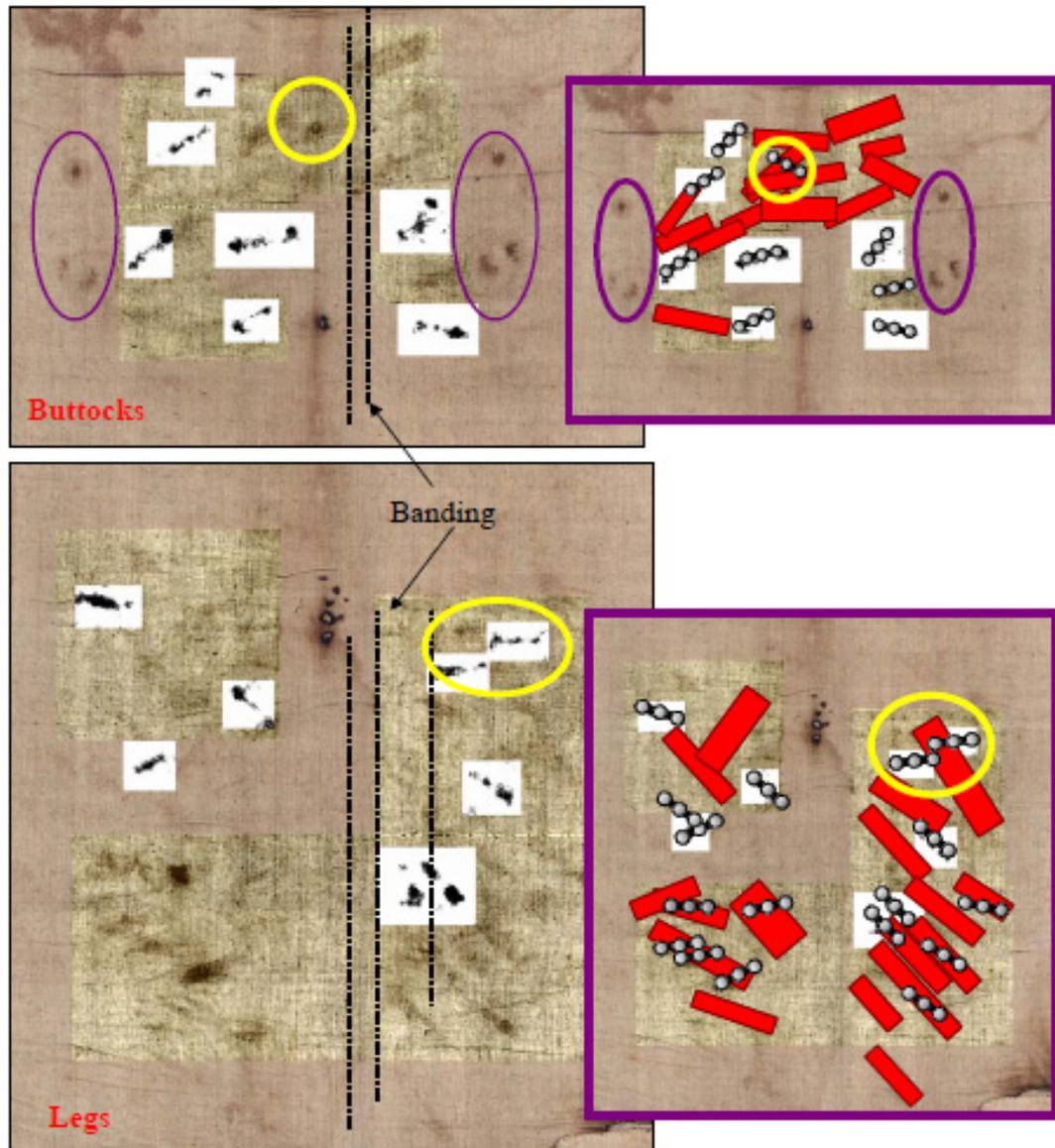


Fig. 8: Image processing of scourge marks on buttock and leg areas. Banding effects are highlighted. Reconstruction of some blows in the smaller frames. Overlapping between Type 1 and 2 in the yellow circles.

Another peculiarity that has nothing to do with whip imprints are the mirror stains within violet circlets of Fig. 8. Although their composition has not been determined yet and the possibility for them to be blood can not be completely discarded (Fanti, 2008), it is more probable that they have been generated by drops of unknown origin which stained the TS when it was folded.

Dorsal Image: calves

In calve area, Type 1 and Type 2 are almost equally represented. In some cases this second type left very deep traces that can be confused with Type 1 by the naked eye (left leg, Fig. 9).

Type 3 is also present close to ankles. This mark could be due to the same instrument

responsible for Type 2, probably a bunch of thin flexible rods or rigid leather cords, which tended to separate while wrapping around the calve, leaving a fan-shaped trace. This kind of whip was common in ancient times, and especially among the Romans, as discussed before.



Fig. 9: Image processing of scourge marks on calve area. Reconstruction of detectable blows in the smaller frame .Overlapping between Type 1 and 2 in the yellow circles.

Frontal Image: chest area

In the chest area Type 2 marks are strongly evident and caused abundant bleeding, but only few Type 1 are recognizable (Fig. 10). Other examples of clear overlapping can be seen within yellow circles. A probable reason for this scarcity of Type 1 scourge marks could be found in the meaning of scourging: it had to be a torture but should not kill the victim. Impacting of the heavy flagrum ending spheres on the chest could have caused high damage, for example to ribs, lungs, and possibly to the heart, leading eventually to the death of the condemned during or immediately after the scourging, as often reported by ancient Roman historians (as reported in the section below). This have been avoided by the executors.

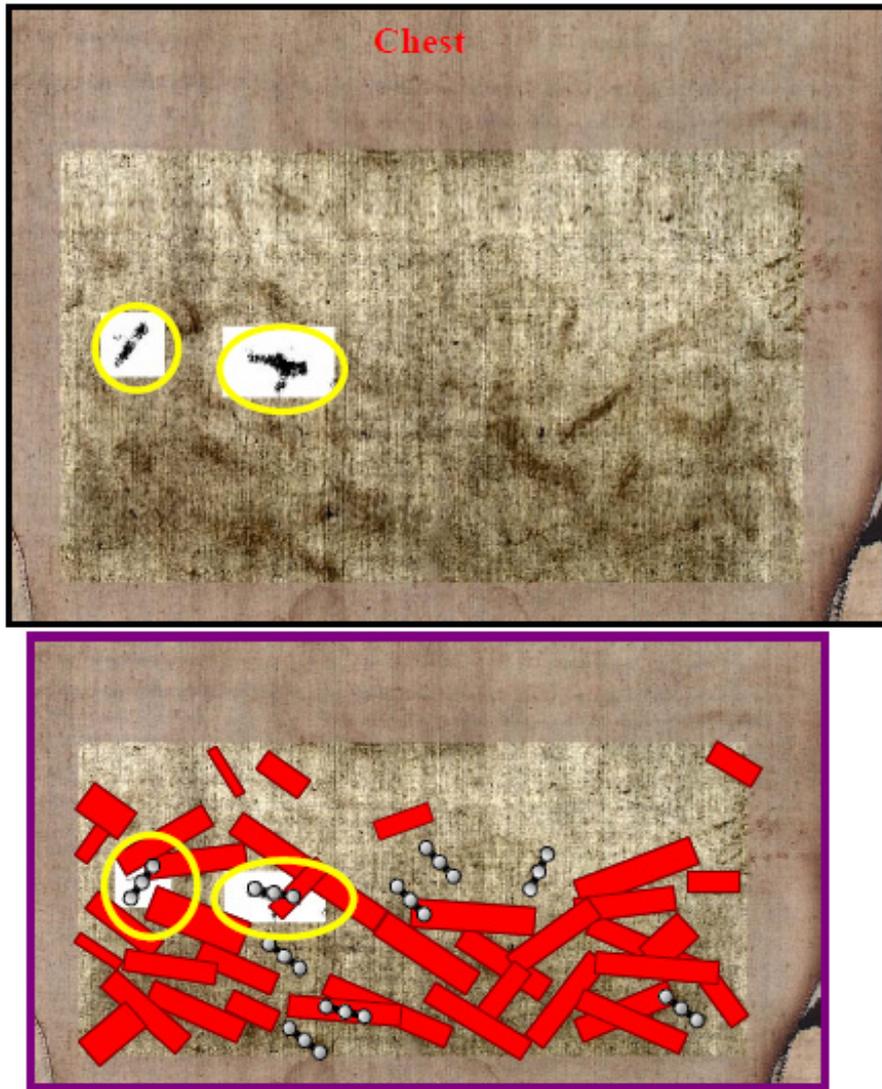


Fig. 10: Image processing of scour marks on chest area. Reconstruction of detectable blows in the smaller frame. Overlapping between Type 1 and 2 in the yellow circles.

Frontal Image: upper leg area

In the front leg area, Type 2 and 3 are the most diffused scour marks, but they are fainter with respect to other zones, except for the central part of the legs, which probably corresponds to the area of highest sheet-skin contact (Fig. 11). Overlapping between Type 1 and Type 2 is found (yellow circles).

Type 1 is scarce and its shape is not well defined even after image processing. It is lacking on the right leg. Interference of water halos has been reduced by additional image manipulation with blurring filters to gain a good scour marks resolution.

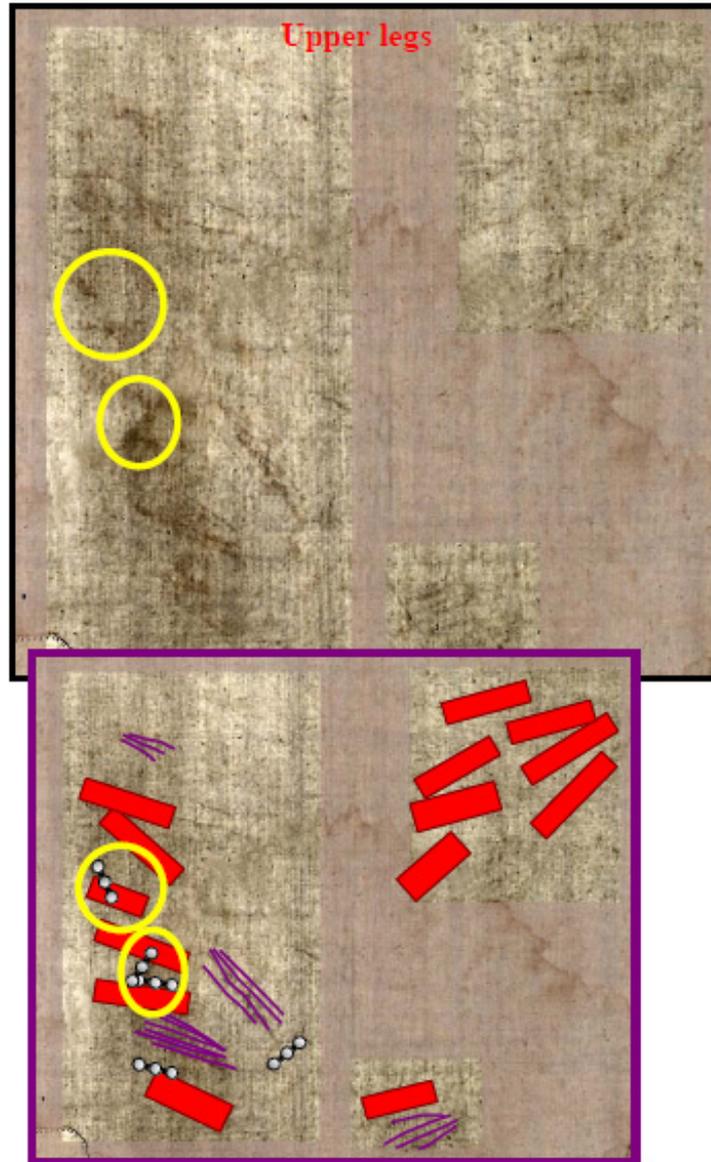


Fig. 11: Image processing of scourge marks on frontal upper leg area. Reconstruction of detectable blows in the smaller frame. Overlapping between Type 1 and 2 in yellow circles.

Frontal Image: lower leg area

In the frontal lower part of legs the contact with the sheet was probably lighter (Basso et al., 2000). Type 1 marks are slightly more evident than Type 2 and both kinds show cylindrical deformation due to partial enveloping of the linen around the calves, their shape resulting bigger and elongated. This effect is more pronounced in the right leg (Fig. 12).

Type 1 and Type 2 overlapping is frequent and it is shown within yellow circles.

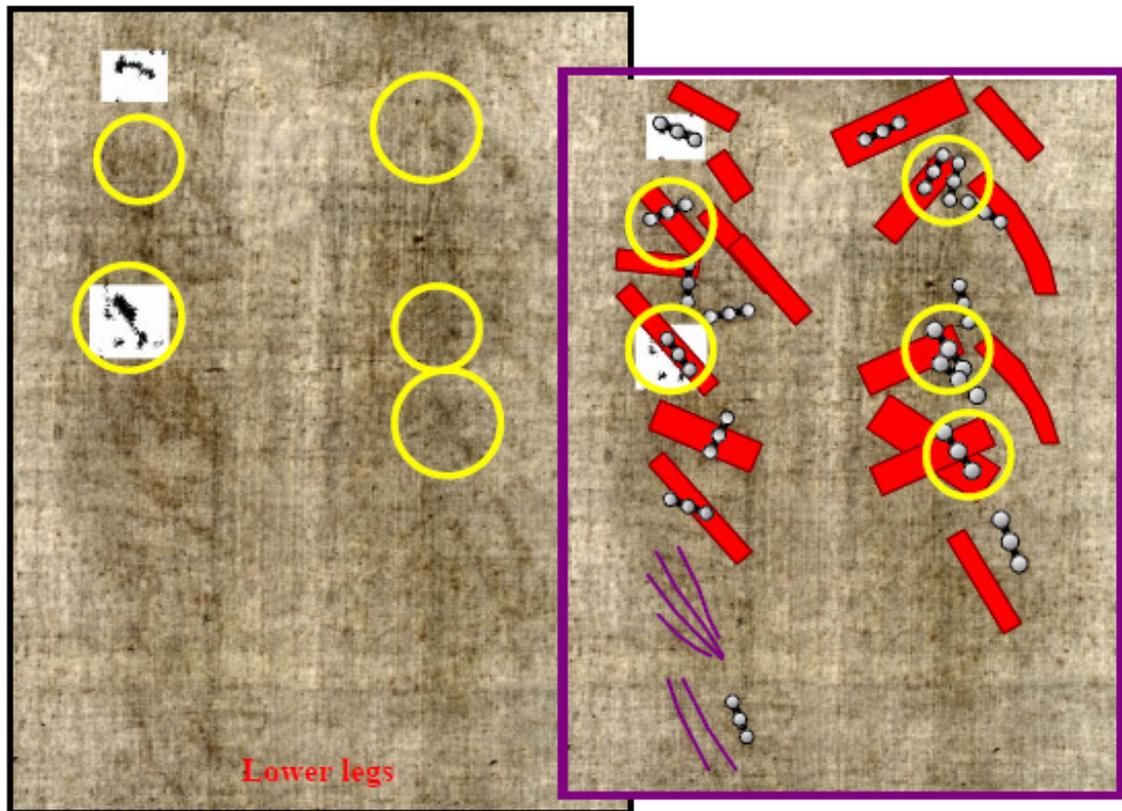


Fig. 12: Image processing of scourge marks on frontal lower leg area. Reconstruction of detectable blows in the smaller frame. Overlapping between Type 1 and 2 in yellow circles.

Frontal Image: arm area

Type 1 scourge marks are present also in the forearms (Fig. 13). This evidence however can not tell anything about the position of the TSM during scourging, because the arms could be hit both if he was bound to a low pillar and if his hands were tied up, or around, to a higher column. It can be only excluded that the hands were tied behind his back, otherwise no whip marks would have been found. The presence of scourge wounds could have affected the shape of the blood flows from the wrist wounds, as can be thought looking at the shape of the rivulet within the green circle of Fig. 13.

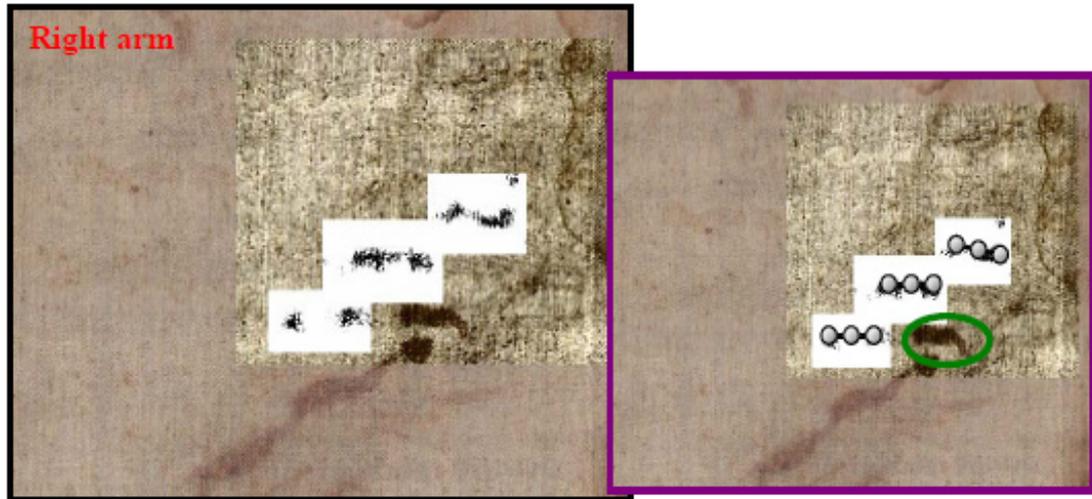


Fig. 13: Image processing of scourge marks on the right arm. Reconstruction of detectable blows in the smaller frame.

Head area

A blood trace similar to Type 2 mark is found also in the head area (Fig. 14). The close similarity could indicate that a scourge blow hit the head, but it is not certain. The presence of hair, indeed, should have given a different imprint with respect to what it is seen where the sheet touched the naked skin, unless the hypothetical blow have ripped out part of the scalp.



Fig. 14: Head area in the dorsal image. A bloodstain similar to Type2 can be appreciated (green circle).

A comparison with the description of Roman flogging instruments has been done to find if the scourge marks seen on the TS can fit them or not, in particular for whip responsible for Type 2.

Scourges and torture sequence

Image processing confirms that the TSM underwent scourging with a “flagrum”, of the kind armed with the so-called “astragala” (*Flagrum taxillatum*). These particular extremities were probably aligned triplets of small rough bones or spiky metal spheres, capable to hook up and rip the skin when pulled back, causing local and sometimes abundant bleeding. The resulting traces are Type 1 scourge marks. Direction and dipping are consistent with the presence of two executors, one at each side of the condemned, as already stated by Ricci (1989) and others (for an exhaustive review see Baima Bollone, 1990 and Fanti, 2008). The total number of flagrum lashes can not be determined, it would be certainly underestimated as we miss information from both sides of the body, and from those areas (for example the belly) that did not return a good image because the contact between sheet and skin was scarce or absent, or bleeding was not so intense to stain the linen. Type 1 marks enhanced in this study, however, are about 115, meaning 40 to 60 blows depending on the number of leather straps (3 or 2, respectively). *Flagra* used in TSM scourging should not end with more than 3 cords, because multiple marks are not found (as it would be expected in the case of the “cat-of-nine-tails” or similar whips). The entire body surface registers Type 1 scourge marks, but they are less frequent in the chest area, presumably avoided not to cause the prisoner’s death. Head has also been saved up but for one single blow on the nose, found by Tamburelli in 1989.

A possible representation of the flagrum used for the TSM is given in Fig. 15.

Before being beaten with flagrums, the TSM had been previously whipped with a different instrument. From TS data this should be similar to a bundle of flexible rods, or hard thin leather straps capable at a certain extent to wrap around body surface, leaving the more evanescent but much more numerous Type 2 imprints. This scourge could be identified with the “Bucædæ” or the “Spanish cords” (similar to the flogger of Fig. 16A), or more probably with another instrument very similar to lictor’s bundles (“*fascēs lictoriæ*” or “*virgæ*”: small rods made of white flexible birch wood) that were also used as symbols of justice and usually carried by the lictors during celebratory processions (Fig. 16B). This whip is probably responsible also for Type 3 marks, its fan-shaped pattern due to little separation of the rods (or cords) while they were slightly wrapping around legs and calves. Again, blow patterns are consistent with a couple of executors. The number of Type 2 lashes evidenced in this study (again underestimated for the same reasons mentioned above) is about 170, meaning a total of 220 ± 10 visible marks for the processed areas.

In the intention of the judge probably this scourging should take the prisoner to “one step from death”, as a form of exemplar punishment, often delivered in Roman trials in both republican and imperial times.

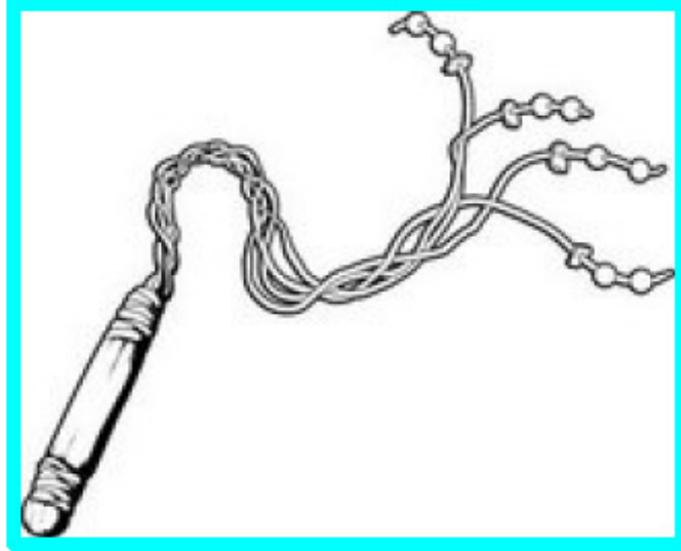


Fig. 15: "Flagrum" whip responsible for Type1 scourge marks.



Fig. 16: Possible kind of whips responsible for Type 2 scourge marks. A: "Bucadae"-like flogger; B: White wood "virgae". Images of the "fasces lictoriae" are reported for comparison on the left.

Open conclusions

Basic computerized processing of the TS image evidenced three different kinds of marks that can be connected to scourging:

- Type 1 (about 35 % of scourge marks) consists of two or three round dots connected by small bars.

- Type 2 (about 65 % of scourge marks) is more numerous and consists of large striped bands of varying length, similar to scratches. They are randomly overlapped by Type 1 marks.

- Type 3 (less than 1 % of scourge marks) is rarer and fainter and it is a fan shaped scratch. It is present only on legs and calves, especially near the ankles.

The first type corresponds to the imprint of the well-known Roman “Flagrum taxillatum”. The last two mark types most probably both originate from a different whip, a sort of bundle of flexible wood rods (“virgae”) or thin rigid leather cords (“Bucadae” or “Spanish cords”).

Even if this is a preliminary study and further investigation is needed, the obtained data speak in favour of the use of at least two kinds of whip. The TSM underwent scourging with different torture instruments, probably by one or two couples of executors.

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