



D11 A BPA Approach to the Shroud of Turin: A Preliminary Examination of the Left Forearm to Reconstruct the Crucifixion Practice

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After attending this presentation, attendees will understand how a Bloodstain Pattern Analysis (BPA) could be performed on the Turin Shroud to reconstruct the original position of the man impressed on the linen.

This presentation will impact the forensic science community by demonstrating the potential of the BPA approach on uncommon pieces of evidence, excluding the traditional crucifixion position with arms stretched out on the crossbeam, and suggesting further evaluation of one of the most controversial and valuable Christian relics.

Following what was proposed previously by the American Academy of Forensic Sciences' (AAFS) community, the presumed patterns of blood stains from the crucifixion wounds on the linen of the Shroud were approached from a forensic point of view in order to reconstruct the arms and body position during blood flow.¹ The goal was to better understand how this ancient death penalty practice — of which almost nothing is known — was performed.

Reddish stains are evident in the head area, in the wrist and forearm, on the chest, and on the feet of the image on the Shroud. The present study is focused on the analysis of the left forearm, where all the traces are visible from the wrist to the elbow. The preliminary goal of a more extensive project is to reproduce the most similar stain pattern from a dripping point on the wrist in different arm positions.

A ballistic angle finder was used, measuring the arm-body (or forearm-body) angle from 0° (arm parallel to the ground and perpendicular to the body) to 90° (vertical arm). The end of a transfusion cannula was fixed at the wrist at Destot's space to simulate the dripping from a puncture-type injury where it is usually believed that the nail for the crucifixion was positioned.

However, since the wrist stain is too large to identify a clear injury spot, two other series of experiments were performed with the aperture of the cannula a little closer to the knuckles or to the wrist.

Whole human blood with anticoagulant was used, the latter having no influence on the flow direction. A transfusion bag was attached to the cannula and placed above the aperture; a rolling clip on the tubing allowed control of the blood flow rate.

All the tests performed clearly demonstrate that the angle between the arm and the body must be greater than 80° in order for the rivulets to flow from the wrist toward the elbow, as it appears on the Shroud. This is more reasonable considering the position of the sentenced person when attached to the cross. Results of this study also preclude the use of any kind of ligature to tie the arm or the forearm horizontally to the crossbeam (*patibulum*) for the "Man of the Shroud." Considering these results, the imprint on the Shroud does not correspond with the traditional artistic image of a crucifix with arms stretched out on the crossbeam; a position with the arms folded backward at the elbow and bent around the crossbeam, as in the painting of Mantegna (*Crocifissione*, 1457-1459) is also not supported by this interpretation. Further analysis will focus on the position of both arms to detect if there is symmetry and to reposition the "Man of the Shroud" on the cross in the most suitable crime-dynamic reconstruction. The final step of this investigation will compare the other reddish stains on the linen (head, chest, and feet) to investigate their correspondence, mutual agreement, and the possible time sequence of their occurrence.

According to the direction of the blood dripping on the left forearm, this study demonstrates that the traditional image of a crucified victim with arms stretched out on the crossbeam perpendicular to the body is not supported for the "Man of the Shroud," who should have been fixed with the arms outstretched upward (arm-body angle greater than 80 degrees).

Reference:

1. Jackson JP et al., The Shroud of Turin as an Object of Forensic Science Investigation. Proceedings of the American Academy of Forensic Sciences; 2010, Seattle, WA.



BPA, Crucifixion, Shroud of Turin