

## Turin Shroud: Comprehensive Impossibility for a Work of Art

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### ABSTRACT

This study builds upon previous research that has demonstrated the hypothesis suggesting the Turin Shroud (TS), also referred to as the Holy Shroud, is a medieval artistic production to be medically implausible.

Beyond the medical considerations, the TS exhibits a double-body image imprint. This phenomenon remains unexplained in its entirety and has not been successfully reproduced in a laboratory setting, even with the most advanced and sophisticated modern techniques.

This research extends the critical analysis of this hypothesis, which continues to be widely disseminated in popular media, by examining the technical and procedural challenges a Hypothetical Artist (HA) would have faced in attempting to produce the observed double-body image on the TS.

This study's primary motivation stems from the author's extensive research on the TS, spanning more than twenty-five years of university-level scientific investigation. Based on this research, the author asserts the authenticity of the TS, as the body of supporting evidence is substantial, while no verifiable data has been identified that would suggest otherwise.

Following a summary of the medical procedures theoretically required for an artist to produce such an imprint, this study further examines, with experimental results too, the even more complex and implausible technical operations that a hypothetical artist would have needed to undertake to produce the TS's double-body image-an outcome that remains, even with modern scientific advancements, effectively "impossible" to replicate.

**Keywords:** Turin shroud; Body image; Corona discharge, Pigments, Radioactivity; Bloodstains; Hemopericardium; Resurrection; Work of art; Middle-ages; Authenticity

### Introduction

A recent study<sup>1</sup> has demonstrated that, from a medical perspective, it is virtually impossible for a medieval artist to have produced the bloodstains observed in correspondence with the double-body image on the Turin Shroud (TS).

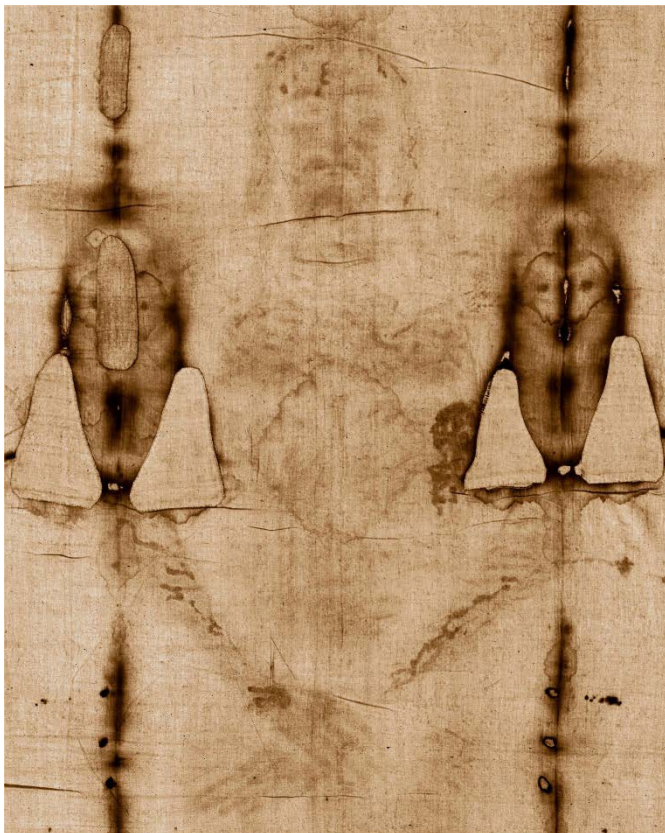
These stains, which exhibit distinct morphological variations, can only be coherently explained by considering the TS as having been wrapped around a human body that underwent severe torture and crucifixion in accordance with execution practices of Roman types, as described in the Christian Holy Bible (CHB).

Moreover, specific characteristics of these bloodstains, such as the absence of smearing, further suggest the presence of a phenomenon that remains scientifically unexplained, potentially pointing to a miraculous occurrence. While the prior study focused solely on assessing the feasibility of a medieval artist replicating these medical characteristics, this article expands the scope of the analysis to a broader context, addressing the theoretical possibility of any artist, from any historical period, being capable of producing the observable features of the TS.

Pope Julius II officially approved the Mass and Office of the TS in 1506 because he considered the TS to be the burial cloth that enwrapped the body of Jesus Christ following His crucifixion, approximately two millennia ago<sup>1</sup>. Furthermore, due to its contact with the blood of Christ, Pope Julius II asserted that the TS should not only be venerated but also revered as an object of adoration<sup>10</sup>.

Recent analyses of blood samples collected from the TS<sup>2-4</sup> have provided novel insights into the physiological state of Jesus Christ during His Passion, crucifixion and entombment described in the CHB.

One of the key conclusions emerging from this research is the hypothesis concerning the mode of Christ's departure from the TS following the estimated 30 to 40 hours post-mortem. The study proposes a novel interpretation based on the concept of material transparency, demonstrating that Jesus' body came out of the TS in a way that did not touch the integrity of the cloth (**Figure 1**). The TS remains an unparalleled object of study at the intersection of archaeology, engineering, forensic science and theology<sup>5-9</sup>.



**Figure 1:** Upper frontal image of the TS (G. Enrie, 1931, digitally improved by the author).

The TS<sup>7-9</sup> is a handcrafted linen textile woven in a 3:1 herringbone twill pattern, measuring approximately 4.4 m (14.4

ft) in length and 1.1 m (3.6 ft) in width. The cloth bears two full length, front and dorsal images of a human figure inexplicably impressed<sup>11-17</sup> upon the fabric.

Recent analyses of blood samples collected from the TS<sup>2-4</sup> have provided novel insights into the physiological state of Jesus Christ during His Passion, crucifixion and entombment.

After examining the innumerable scientific and historical data, the author is convinced that the TS is indeed the authentic Shroud of Jesus Christ<sup>1-4</sup>.

Historical analyses provide further indications of the TS's antiquity and authenticity; numismatic studies<sup>18</sup> have identified clear correspondence between the facial image on the TS and artistic depictions of Christ on Byzantine coins dating from the 7<sup>th</sup> century AD onward.

After disappearing following the Sack of Constantinople in 1204, the Relic known as the "Shroud of Christ" reemerged in Europe in 1353 in Lirey, France. Historical records made the beginning of its well-documented presence in Western Europe.

In 1532, while housed in the Sainte-Chapelle of Chambéry, France, the TS sustained damage in a fire evident on the cloth still today. In 1578, the TS was transferred to Turin, Italy, where it has since been preserved, except for brief periods during times of war.

In 1988, radiocarbon dating of the TS yielded an erroneous date range of 1260–1390 AD<sup>19</sup>. This result remains a subject of ongoing debate<sup>20-24</sup>, with multiple studies challenging its reliability due to very probable contamination especially caused by environmental factors.

Recent findings, including the detection of Beta radioactivity and fluorescence in the bloodstains on the TS<sup>1-3,25</sup>, further confirm the inaccuracy of the radiocarbon dating results. These discoveries suggest that neutron reactions related to the body image formation may have skewed the radiocarbon measurements.

The presence of selective radioactivity detected in the TS<sup>1-3</sup> strongly indicates that the 1988 radiocarbon dating results are biased by an intense neutron flux that altered the isotopic composition of the linen fibers, leading to a younger apparent radiocarbon age. Such a neutron flux could be easily associated with the Resurrection of Jesus Christ.

Before addressing the currently insurmountable issue of the formation of the "impossible" body image—an aspect that will be discussed in detail later—this article first synthetically examines<sup>1-4</sup> the physical condition of Jesus Christ as inferred from forensic analysis of the TS. It also synthesizes the extremely complex and medically implausible procedures a Hypothetical Artist (HA) would have had to execute to replicate the highly specific and anatomically accurate details observed on the TS.

### Authenticity of The Turin Shroud

Authenticity of the TS is often understood to mean different concepts that are discussed in Ref.<sup>1</sup>. Here, the intended concept is that the TS wrapped the body of Jesus Christ, who was severely scourged, crowned with thorns, crucified and died before being resurrected. His image was transferred to the TS through a release of energy during the Resurrection, resulting in an indelible double body image that remains visible even after two millennia.



Ref.<sup>1</sup>, basing on Refs.<sup>5,6</sup> too, also critically compares the claims in support of the medieval work of art hypothesis for the TS with the strong points in support of authenticity, thus highlighting how weak the art hypothesis is. The scientific literature highlights numerous contributions in favor of the authenticity also reported in Refs.<sup>1,5,6,26,27</sup>.

The author has performed several experiments<sup>28,29</sup> wrapping various statues and mannequins with semi-transparent copies, even life-size, of the TS, both to study the characteristics of the wrapping of the Relic and to determine the type of distortions present in the body image of the TS caused by the wrapping of a fabric with a three-dimensional body (**Figure 2**).

In fact, details of distortions emerged, especially in reference to the chest and legs, that no artist would have thought of reproducing if he had not conducted experiments in wrapping three-dimensional human bodies. It was impossible for an artist to impress all those characteristics of the blood (microcytes, creatinine, radioactivity, fluorescence, etc.) that were extremely particular even at a microscopic level when, in the Middle Ages, the microscope (invented in 1590) was not yet known.



**Figure 2:** Experiments performed by the author wrapping various statues with semi-transparent copies of the TS to study body image distortions.

### Medical Notes On The Physical Status of Jesus

We believe it is useful to synthetically consider the particular state of Jesus wrapped in the TS before proceeding to the analysis of the formation of the body image. Refs.<sup>1-4,29-34</sup> confirm the presence of blood consistent with the typical torture wounds suffered by Jesus.

In particular, Ref.<sup>3</sup>, in addition to the unusual reddish color of type A blood, notes that this blood is mixed with earthy material typical of Jerusalem and is composed of microcytes measuring between 0.3 and 2 micrometers. It, therefore confirms the severe uremia due to the flagellation of the kidneys that Jesus suffered

and the consequent difficulty in exchanging oxygen, which caused extremely labored breathing. Creatinine particles (from 50 to 200 nm) found in this blood confirm the atrocious torture suffered by Jesus, also described in the CHB. Refs.<sup>1,4</sup>, therefore, reconstruct the sequence of events and pathologies that led to the painful death of Jesus on the cross, culminating in a heart attack followed by hemopericardium.

The heart disease (“crepacuore” in Italian), caused by psychological stress, began at the Last Supper [John 13:1-3] and was accentuated in the Garden of Gethsemane, where Jesus manifested hematidrosis [Luke 22:44]. He was then severely beaten [Mark 15:19, Isaiah 50:6] and subjected to a heavy flagellation that caused severe hypovolemia with significant traumatic insult to the heart<sup>1,2</sup>. The heavy cross accentuated the congestive heart failure, worsening the cardiovascular dysfunction. Renal failure causing microcytic anemia with consequent tachycardia and coagulopathy caused by blood loss, hypovolemic shock and severe dehydration [John 19:28] further burdened the heart.

The cardiac lesions then also increased the following generated tonic and clonic contractions. Congestive heart failure, accentuated by the spiritual agony suffered by Jesus for the insults received [Psalm 69, 20], increased the stress that caused a pericardial effusion with consequent hemopericardium (not to be confused with Takotsubo pathology, sometimes assumed as a cause of death<sup>37,38</sup>). Incidentally, death by hemopericardium associated with severe chest pain is consistent with the loud cry that Jesus uttered shortly before dying [Mark 15:37].

After death, the body of Jesus in evident rigor mortis<sup>27,39,40</sup> consistent with the position assumed on the cross<sup>28,41</sup>, was wrapped in the TS. Analyses show that the body remained wrapped in the TS for only 30-40 hours because there were no signs of putrefaction on the cloth. The lack of smearing in the bloodstains transferred in the liquid state demonstrates that the body was not tampered with or moved.

Combining these facts, it can be deduced that the body of Jesus passed through the TS without materially compromising it<sup>1,2,4</sup>. The perfect congruence between the CHB, which extensively mentions the Resurrection of Christ, suggests that an intense form of light-energy made the human body transparent to matter<sup>1,2,4</sup>. Extending this hypothesis, one can similarly explain how the Baby Jesus came out of the womb of the Mother, according to the Marian dogma of the “Virgin before, during and after the birth”<sup>42</sup>.

### Medical Impossibility For A Work of Art Based on Blood Evidence

In addition to solving the problem of the impression of the indelible body image on the linen fabric that will be considered later to obtain the result that we observe on the TS, we must summarize the medical conditions reported in Ref.<sup>1</sup>, necessary to obtain the particular bloodstains.

From the TS, we know that it wrapped a corpse that released particular bloodstains; to obtain such a result, a HA would have had to perform the following very complicated and illogical explanation operations.

The HA, aided by various accomplices, would have had to murder a person after having severely tortured him with flagrums and a crown of thorns. Since he would not have been able to

obtain the perfect result seen on the TS at the first tentative, the HA would have had to perform various preliminary experiments becoming therefore a multiple murderer-torturer.

With heavy torture, the HA would have had to seriously compromise the kidneys that would not have filtered the urea; this, released into the blood, would have had to make the red blood cells microcytes with consequent serious breathing difficulties and tachycardia due to reduction of oxygen exchange.

Then the HA would have had to nail the victim to a cross-causing death by hemopericardial tamponade. In the next time of less than 40 hours the HA would have to wrap the victim in a radioactive burial shroud and then not move the corpse from its initial position for several hours to allow its wounds to drip more blood onto the linen cloth.

### Body Image Features of The TS

To understand the extreme difficulty for a HA to reproduce the body image of TS, one must first remember the following very particular characteristics that even today do not seem possible to produce together.

Among the various particular features of the TS body image, also reported in Refs.<sup>7,8,11,13,17,41</sup>, the author believes that the Evidence, En (where “n” is the Evidence number), noted below, taken from Table 1 of Ref.<sup>12</sup> (where the number Cn is here indicated in brackets) are sufficient to demonstrate the practical impossibility for a HA to reproduce the image.

#### Evidence at a macroscopic level:

- E1 The body image has the normal tones of light and dark reversed so the body parts nearer the cloth are darker. This fact leads us to state that the body image appears as a photographic negative (C2).
- E2 The luminance distribution of both front and back images can be correlated to the clearances between the 3D surface of the body and a covering cloth. This is why TS is a 3D image (C3).
- E3 Image distortions of hands, calves and torso correspond to the wrapping of a man in a sheet. Therefore, considering Ref.<sup>1</sup>, the TS wrapped a dead human body (C9, C10).
- E4 Some bloodstains also appear outside the body image (C23).
- E5 The body image has a resolution of  $4.9 \pm 0.5$  mm but no well-defined contours. This means the body image seems to disappear if one looks at it from a distance closer than about one meter (C6).
- E6 The front image, at least near parts of the head, is doubly superficial. This means that the 0.34-mm-thick fabric presents a superficial image on one side (about 0.03 mm thick), no image in the middle and another superficial image on the other side (C5).

**Evidence at the microscopic level:** Figure 3 shows a reference non-image sample of the TS.

- E7 The coloration does not appear under the threads where they cross in the weave of the cloth (C15).
- E8 The image fibers are adjacent to non-yellowed fibers: striations are evident (**Figure 4**, C16).
- E9 Color is frequently concentrated in the crevices where two or more threads cross each other (**Figure 5**, C17).

- E10 There is no cementation between fibers or signs of capillary flow in the image areas (C20).
- E11 The linen fibers of the image lie only on the uppermost portions of the threads, leaving the inner fibers uncolored (C14).
- E12 The fibers are uniformly colored around their cylindrical surface, whereas variations in color intensity can be detected along the fibers. The color is not concentrated in spots as we could expect from a pigmented fiber (C19).



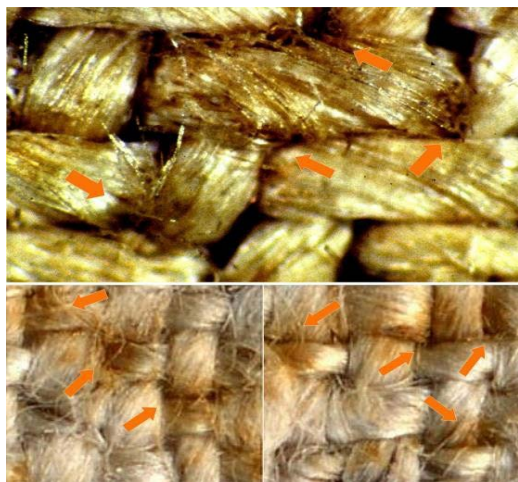
**Figure 3:** Reference non-image sample of the TS.



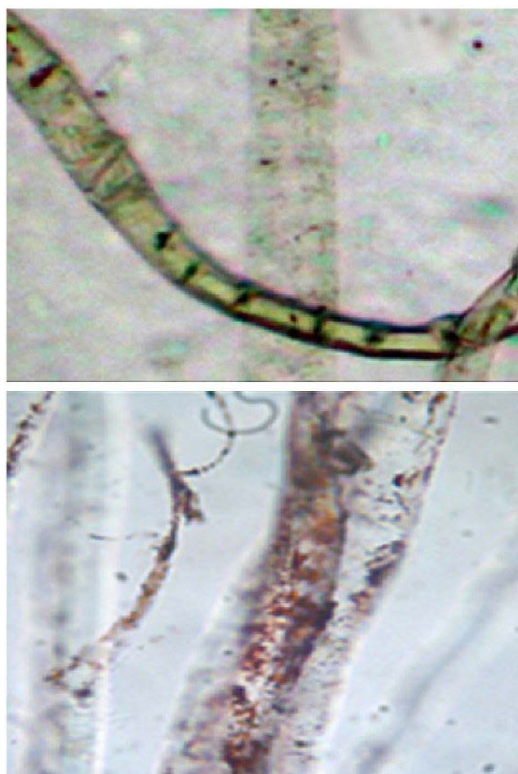
**Figure 4:** Striations (E8) of the image-threads: on the top, detail of the TS eye (M. Evans ME20, ©STERA Inc. kind permission of B. Schwartz), where also a crevice appears; on the bottom, for comparison striations obtained with Corona Discharge (CD) experiments.

In reference to Evidence E4, Ref.<sup>3</sup> (Fig. 6.2) has further highlighted the fact that scourge wounds appear outside the body image (shoulder), thus showing the clear contrast between an extremely intelligent (and murderous) HA who would have obtained an image that is still not reproducible today and at the same time a HA who instead made a big mistake in tracing the bloodstains on the outside of the human body. However, this can be explained if one thinks of an image formation using CD (Corona Discharge)<sup>16,17</sup>.





**Figure 5:** Crevices (E9) of the image-threads: on the top, detail of the TS foot (M. Evans ME16, ©STERA Inc. kind permission of B. Schwartz); on the bottom, for comparison crevices obtained with CD experiments.



**Figure 6:** On the top, image and non-image TS fiber coming from STuRP-1EB sticky tape (calf area). On the bottom, image fibers colored with iron oxide pigments, according to E. Craig's technique described in Ref.<sup>12</sup>.

### Hypotheses Formulated To Explain The TS Body Image

After Secondo Pia published the first photograph of the TS in 1898, countless hypotheses were formulated on the formation of the body image without managing a complete explanation. The most interesting ones, reported in Ref.<sup>12</sup>, are synthesized below.

P. Vignon, in 1898, hypothesized that the image resulted from contact with a living body smeared with chalk. In 1900, A. Loth was the first to propose electrical energy as the primary source for forming the image, consisting of lightning.

R. Colson improved Vignon's hypothesis shortly after,

describing a chalk mold covered with zinc dust placed on a photographic plate and Vignon, in 1902, proposed another hypothesis based on the formation of the image due to the emanation of ammonia vapors produced by a corpse. Several scholars then improved this hypothesis; first of all, R. Rogers who, at the end of the twentieth century, referred to it as the Maillard reaction between amines and sugars.

J. Volkringer, studying the imprints produced in old herbals by the pressure of leaves, proposed a formation caused by direct body-leaf contact.

Other scholars such as G. Judica Cordiglia, M. Moroni, S. Rodante and R. Romanese used sculptures or real human heads soaked in blood, urea, sweat, aloe and myrrh and covered with linen or leather to support the contact hypothesis.

However, detecting the failure of their intent, some researchers, such as M. Alonso, member of Shroud-Science Group (SSG), proposed mixed mechanisms combining the hypothesis of gas diffusion and that of contact.

While until the mid-1900s, several artistic copies were made declaring their origin as that of O. Visone, toward the end of the 1900s, anonymous artistic copies were made trying in vain to demonstrate that a medieval artist could have reproduced the TS. Among these we find E. Craig, J. Nickell, N. Wilson and L. Garlaschelli who used pigments or chemical reagents affixed to the linen fabric and V. Delfino Pesce who used a bas-relief of heated metal. N. Allen instead proposed a particular photographic technique.

A large group of scholars turned their attention to hypotheses based on the emission of particular neutrons, protons or electronic radiation either by the human body wrapped in TS or hypotheses based on the corpse exposed to particular radiative sources. Among these, J.B. Rinaudo proposed a double source of protons (which caused the formation of the image) and neutrons (which caused the rejuvenation of the C-14 age of the cloth), J. Jackson hypothesized a soft UV burst of energy, G. Baldacchini proposed an excimer laser source, G. De Liso proposed a piezoelectric source produced by an earthquake acting on quartz rocks connected to emissions of radon gas.

After A. Loth, an increasing group of scholars hypothesized that the CD, due to an intense electric field, could explain the image of the TS. According to O. Scheuermann and Whanger & Whanger, the body image is due to a source of energy emanating from Jesus during the Resurrection; F. Lattarulo and G.B. Judica Cordiglia instead independently proposed the hypothesis of a human body floating in an intense natural electric field perhaps produced by a neutron flux.

The Author<sup>17</sup> has recently revised a previous hypothesis, suggesting the formation of the body image in the Divine Photography Hypothesis (DPH) employing a chemical Maillard reaction based on the contact between sugars and amines, added to the CD hypothesis generated by the Holy Fire of Jerusalem (HFJ). The HFJ is a very particular energetic phenomenon produced by intense electric fields that are repeated annually in the Holy Sepulcher of Jerusalem for many centuries. This electrical type phenomenon was necessary to reproduce the image of the TS.

In particular, according to the DPH, the TS wrapped the body of Jesus Christ when He was laid in the Holy Sepulcher of Jerusalem and an oily mixture of myrrh and aloe was used for the burial. These substances, also composed of sugars, would have mixed with the post-mortem fluids exuded by the corpse, such as the urea not filtered into the blood by the kidneys already compromised by flagellation.

During the Resurrection, there was a light very similar to the HFJ and an intense electric field generated a CD. Instantly, the Body of Jesus became materially transparent collapsing the TS on the stone of the sepulcher under the force of gravity.

The electric field of the HFJ produced electrons that activated chemical reactions selectively localized on the fibers closest to the human body and the directionality of the electric field allowed 3D information relative to the human body to be encoded on the TS.

Over time, the invisible defects produced by the Maillard reaction activated by the HFJ energy on the linen fibers oxidized and dehydrated thus producing the darkening of the image now observed.

From this long list of hypotheses, it emerges how difficult, if not impossible, it is to try to physically reproduce a body image on linen reflecting all the particular features listed above (and others omitted in this paper for the sake of simplicity).

### Impossibility For The Body Image To Be A Work of Art

We have seen above that a work of art based on blood evidence is implausible from a medical point of view. Now let's consider the extreme difficulty a HA would have in reproducing the double body image observed on the TS independently of the medical difficulties already mentioned that would be added to those presented below.

The Evidence previously listed is divided into two categories: macroscopic type (E1-E6) and microscopic type (E7-E12).

As regards the macroscopic Evidence it is clear that is extremely difficult for a HA to apply and, above all, useless and contrary to the artistic result that would be obtained. Why would the very intelligent HA have reproduced, who previously brilliantly resolved all the medical difficulties reported in Ref.<sup>1</sup>, an image with the gray tones inverted (E1) that would make the result less easy for the observer to understand? And why would he have built an image with 3D information (E2) that is not directly interpretable by the observer? The distortions of the body image (E3), typical of a 3D body wrapping, do not make a credible result and, therefore, should be avoided.

Then, positioning the wounds of a man outside the body image (E4) would be a contradiction typical of an inexperienced artist.

The fact that the image does not have well-defined edges (E5) is not only difficult to obtain artistically but is also contrary to the result the HA wants to obtain. The body image disappears to an observer at a distance of less than one meter (3 feet).

Finally, obtaining a doubly superficial image (E6) is a truly difficult undertaking for a HA who would have to backlight the linen fabric to superficially reproduce the color on the back of the sheet without having any artistic advantage for the observer.

This Evidence, considered separately from the rest,

highlights the absurdity of a HA working so hard to obtain the results contrary to working on a valuable artistic work.

Turning attention to all E1-E12 Evidence, we formulate two scenarios based on the hypotheses most frequently presented by scholars without considering the already-discussed insurmountable medical aspects. The first refers to the difficulties that a hypothetical painter would encounter and the second refers to the exposure of the human body to an intense energy source.

### Hypothetic Painter

To understand the enormous difficulties that a HA might encounter in obtaining a body image similar to the TS, let us look at the model in (Figure 7). If we ideally extract a thread of the TS body image, whose diameter is about 0.25 mm (0.0098 inches) and magnify it about 300 times, we can think of it as similar to a bundle of drinking straws. Each straw is a flax fiber with a diameter of about 0.015 mm (0.00059 inches). On one side of the bundle, on its top, we see a dozen-colored straws next to uncolored straws.

Using a simple painting technique, let us think of the operations required for a HA to reproduce the E1-E12 Evidence of the TS listed above on a common linen cloth.

First, the HA must dip the brush not in the color because there are no pigments on the threads, but in an acid that can chemically stain the linen. However, the HA must see what he is painting, so the acid (usually transparent) must be colored beforehand, even if he must eliminate every trace of that pigment once the work is finished because there is no colorant on the TS.

Since colored fibers are next to the uncolored ones, the brush must have a single bristle with a diameter no greater than that of a single linen fiber. However, the HA must also color the underlying part of the fiber without coloring the adjacent fibers since the color is uniformly distributed around the circumference of the single image fibers.

Finally, the HA should paint individually in this way the several million image fibers of the TS, thus using a microscope (not existing in the Middle Ages), but simultaneously, through a mirror-and-lenses-system, observing the body image from at least 1 m away, corresponding to 300 m (984 ft) away in the drinking straws model, because when we approach the TS, the body image disappears from view.

If these difficulties seem insoluble today, they seem impossible for a hypothetical, albeit brilliant, medieval HA.

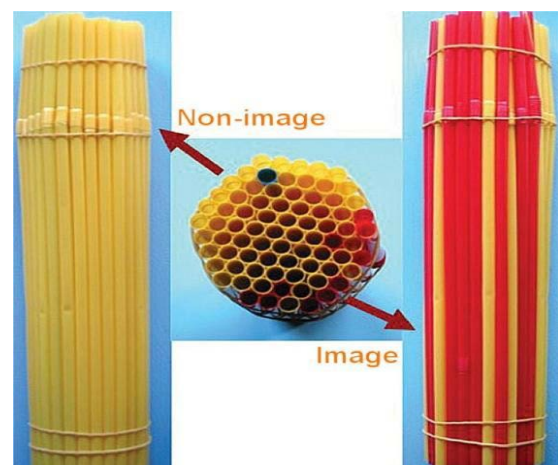


Figure 7: Drinking straws model to represent macroscopically a TS linen thread.



## Hypothetic Radiation Source

Several experiments have been performed subjecting 3D bodies to different energy sources, but many results have been quite disappointing. Perhaps the best result is the one discussed in Ref.<sup>17</sup> (**Figure 3** of that paper) and described above as the DPH. The effect of intense electric fields (CD) produced a whole-body image where all the characteristics considered at the microscopic level have been verified. However, at the macroscopic level several improvements are still necessary.

## Example Showing The Impossibility To Reproduce The Body Image

These difficulties in reproducing the characteristics of the TS still seem insurmountable today and are, therefore, even more so for a hypothetical, albeit brilliant, medieval HA.

However, there are still several people in the world who, ignoring (perhaps intentionally) many of these particular features of the bloody body image of the TS, declare through the media that they have succeeded in reproducing the image.

Below is a detailed example that, although illogical, easily convinces many people who are not experts on this specific topic. We consider the case of Dale Glover, host of the podcast "Real Seeker" and member of SSG who was interested in providing the author with the experimental results regarding the hypothesis of image formation formulated by HF (Hugh Faley, member of SSG). He analyzed them in relation to the E1-E12 Evidence listed above.

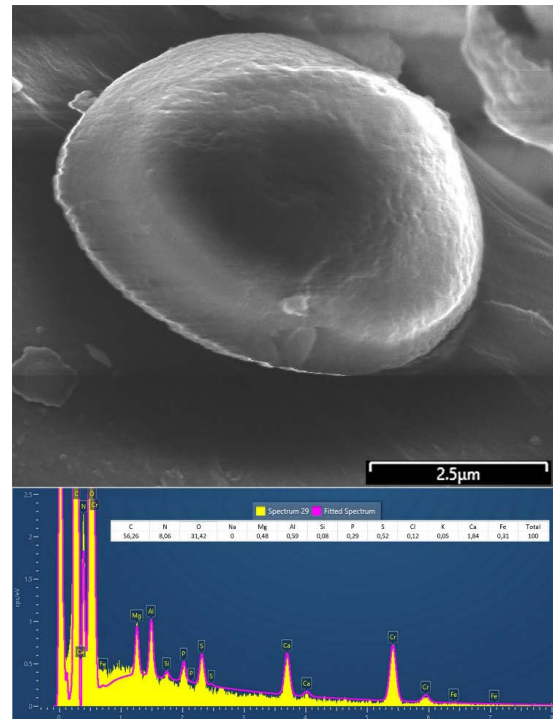
Before going into detail, it should be noted that HF states that TS is still little studied today, ignoring the dozens of publications in important Journals, first of all, Refs.<sup>7,8</sup> and therefore, indirectly underestimating, in the author's view, the entire group Shroud of Turin Research Project (STuRP) that in 1978 made very detailed scientific studies on TS.

To drastically simplify the problem of his TS reproduction, HF bypasses all the practically insurmountable problems related to the presence of the very particular types of blood by declaring that the problem associated with the presence of blood on the TS is still controversial today. Thereby, HF shows that he does not know the specific characteristics of TS blood in Refs.<sup>1-6,25</sup> which explained the reason for the controversies that occurred almost half a century ago in Refs.<sup>34,35</sup>.

With reference to this last point, the author takes the opportunity to confirm what is reported in Ref.<sup>3</sup> where the Type C blood from the face is preliminarily described. Subsequent analyses confirm the presence of various red blood cells, erythrocytes, of dimensions slightly smaller than those typical of human blood in correspondence with the face, see (**Figure 8**).

This result confirms that the Type C blood was shed before, due to the flagellation, the kidneys ceased functioning, thus producing an accentuated uremia that shrank the erythrocytes. Consequently, it can be thought that these blood cells can be directly correlated to the hematohidrosis manifested by Jesus in Gethsemane.

HF described the procedure, which is briefly reported below, obtaining the result shown in (**Figure 9**). Two experiments used a TS-like fabric and a brass bas-relief approximately 10 cm x 10 cm. For the paint, one egg yolk, 50 cm<sup>3</sup> of water, 50 cm<sup>3</sup> of malt vinegar and 0.5 g of yellow ochre were mixed. A swab dipped in the paint then pressed onto the fabric resting on the bas-relief produced the image.



**Figure 8:** Erythrocyte of Type C blood of Ref.<sup>3</sup> 6 micrometers in size. On the bottom is the spectrum of the elements with the weight percentage. Peaks of chrome are present because the sample was previously metallized.

Sample 1 was lightly washed to (hypothetically, author's note) remove surface debris and Sample 2 was washed and scrubbed with a toothbrush to (supposedly, author's note) remove as much pigment as possible. Both samples were then ironed to remove creases.



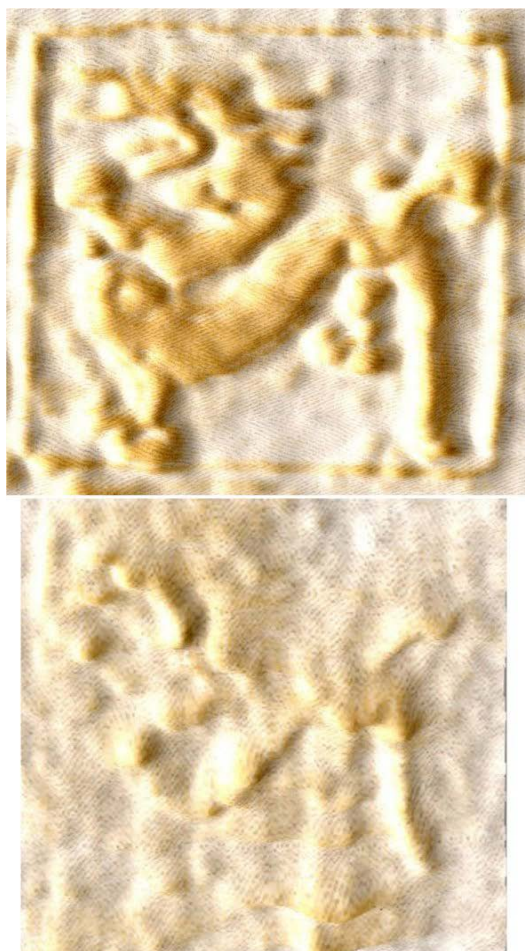
**Figure 9:** HF's Samples 1 (above) and 2 (below) reproducing a 10 cm x 10 cm bas-relief.

Let us now analyze the two results obtained by HF, specifying that if only one Evidence among the selected ones, E1-E12, is not satisfied, we must conclude that these results cannot reproduce the body image of the TS.

Let's consider the two results on the front of the Evidence E1-E6 related to a macroscopic level.

E1 (reversed tones) and E2 (3D) can be accepted (**Figure 10**), but E3 (distortions) are not easy to determine in a bas-relief. E4 (bloodstains) are intentionally forgotten to oversimplify the experiment. E5 (contours), even if the scale effect must be considered, shows contours that are too accentuated to affirm that an image similar to the TS has been reproduced.

Finally, regarding E6 (double superficiality), we find an effect different from that of the TS image. In some areas of the back of the linen fabric, we find some spots consistent with the image of the front side, but these spots do not appear because of a double superficiality. Instead, they appear because the color has been absorbed in the whole thickness of the fabric, thus passing from one side to the other.



**Figure 10:** 3D effect of the HF's Samples 1 (above) and 2 (below) reproducing a 10 cm x 10 cm bas-relief.

Now, let's consider the two results on the front of the Evidence E7-E12 related to a microscopic level.

The color is absorbed in an area greater than or equal to one-third of the section of the linen thread of the fabric; therefore, Evidence E7 (crossing threads) is verified in many cases, but Evidence E11 (uppermost portions) is not. Evidence E8 (striations), too, is not verified except in some very rare cases that cannot be considered typical of the result analyzed.

Evidence E9 (crevices) fails; indeed, a position of the color is accentuated in proximity to the protuberances of the thread with respect to the plane of the fabric. This characteristic is also easy to explain because these protuberances are the first to come into contact with the pad impregnated with pigments.

Evidence E10 (cementation), although not frequent, contrarily to the TS image, is found above all in the areas of more intense color (**Figure 11**).

Evidence E12 (uniformly colored) is perhaps the most important way to highlight the complete non-conformity of the proposed method with respect to the characteristics of the TS fibers, which are uniformly colored without showing pigment traces. **Figure 11** (similar to what is highlighted in **Figure 6** on the bottom) demonstrates that all the Samples analyzed show that the fabric's color is due to the micrometric particles of yellow ochre used as pigment. So, we have to observe the inability of HF to achieve the desired result.

Finally, it should also be noted that all the linen fabric of two Samples 1 and 2 show traces of blackish material near the upper parts of the threads that are absent on the TS linen fabric.



**Figure 11:** Yellow ochre pigment on the linen fibers of HF's Sample 2 showing the evident difference with the TS body image.

In conclusion, it can be stated that the HF's hypothesis (only partial because it completely neglects the bloodstains, see E4) completely fails to reproduce the TS body image.

In synthesis, at the macroscopic level, E5 (contours) is not respected, while at the microscopic level, E11 (uppermost portions), E8 (striations) and E9 (crevices) are not respected. In addition, E10 (no cementation) is not respected everywhere. However, the most crucial evidence that characterizes the failure of the proposed hypothesis is Evidence E12 (uniformly colored) because particles of yellow ochre used as pigment are evident everywhere.

### Concluding Remarks

This article integrates a recent publication<sup>1</sup> in which the hypothesis that the TS is the result of a work of art produced by a medieval artist has been demonstrated to be absurd from a medical perspective. In addition to the medical aspects, one must also consider the double body image that cannot be scientifically explained to date.



Therefore, let's consider the sum of the medical difficulties highlighted here in reproducing the double body image. The reader can understand how difficult, if not impossible, it is to reproduce an Object such as the TS and, therefore, understand what absurdities are frequently spread by the media when persons interviewed claim "I reproduced the TS"!

Starting from the recent discoveries regarding the blood of the TS reported in Ref.<sup>1</sup>, also integrating them with an important confirmation regarding the Type C blood preliminarily described in Ref.<sup>3</sup> and after having ascertained the perfect congruence between what has been scientifically found on the TS with what has been reported by the CHB, the immense suffering voluntarily endured by Jesus Christ for us men and for our salvation have been summarized here. In particular, the tortures suffered by Jesus until His death on the cross are recalled, highlighting the series of pathologies induced by them and explained in Ref.<sup>1</sup>.

Among other things, it is recalled that Jesus of the TS was wrapped like a corpse but remained there for no more than about 30-40 hours, that He was crowned King of Redeeming Sorrows with the crown of thorns and that the microcytes found in the bloodstains highlight the respiratory pathology of His last moments on the Cross.

After having summarized, from a medical perspective, how difficult and illogical it is to consider the TS as the product of an artist's work, we moved on to analyze 12 particular pieces of evidence typical of the body image imprinted on the TS that still make it inexplicable and unreproducible today. The most essential hypotheses of image formation have been considered, highlighting the current impossibility of obtaining the desired results.

Two hypotheses are then described, practically unrealizable from an experimental point of view. They explain how difficult it is to even think of producing a copy of the TS that respects all the very particular characteristics highlighted therein.

Someone, reading the hypotheses described by the author to try to explain the bloodstains on the TS, accused him of having only a lot of fantasy. Now, the same reader will accentuate this accusation even more. The author strongly encourages him and anyone who even thinks something like this to propose something easier to realize experimentally and that allows the achievement of all the desired results herein described.

In conclusion of this discussion, the result provided by HF, who publicly (on the podcast "Real Seekers") claims to have found a procedure to copy the TS is, experimentally analyzed, showing instead how far this result is from the actual production of a copy of the most important Relic of Christianity.

Assuming but not admitting that the HA had somehow managed to copy at least in part the TS, the following questions arise: why would the HA have made superhuman efforts to obtain an object that would be only partially understood by scholars of the twenty-first century? Why would the HA want to try to reproduce what he did not know in the Middle Ages, such as radioactivity?

The author concludes and makes his own the following concepts expressed by Theodora Pappas, Administrator of SSG. Through the evidence of the TS, we can help bring other doubters to Christ to avoid a destiny of suffering in hell. Furthermore, the TS provides us with such powerful proof - beyond any

reasonable doubt - of the existence of God that believers can transform their "faith" in God into certain knowledge of God, which is infinitely better!

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## Ethical Statements

As more widely reported in Ref.<sup>1</sup> the author, belonging to the Christian Roman Catholic religion, experienced a profound strengthening of faith through scientific studies on the TS.

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## Conflicts of Interest

The author declares no conflict of interest.

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