

# **The death of the Shroud Man: an improved review**

**Barbara Faccini<sup>1</sup>, Emmanuel M. Carreira<sup>2</sup>, Giulio Fanti<sup>3</sup>,  
Jose de Palacios<sup>4</sup>, Jose Delfin Villalain<sup>5</sup>**

<sup>1</sup>University of Ferrara, via Saragat 1, Ferrara, Italy

<sup>2</sup>CES (Centro Espanol de Sindonologia of Valencia)

<sup>3</sup>DIM, Padova University, Italy, [www.dim.unipd.it/fanti](http://www.dim.unipd.it/fanti)

<sup>4</sup>Surgical Department of Madrid University

<sup>5</sup>Department of the Camilo Jose Cela University (Madrid)

## **ABSTRACT**

In the second half of the last century the hypothesis of the TSM (Turin Shroud Man) survival after his execution has been first formulated and since then it has been periodically reexamined by some authors. Very few medical experts, but not so expert in the TS (Turin Shroud), affirm that the TSM was enveloped in a comatose condition and, after a recovery, he came out of the sepulcher.

Most of medical and TS experts, however, agree that TSM was already dead when buried, because of the severity of the injuries, the presence of post-mortem stiffness, and many other evidences that will be discussed in this paper. The sum of all these data lead to the conclusion that the man enveloped in the TS was a corpse.

## **1. INTRODUCTION**

Since the first discovery of its peculiar photographic negative characteristics in 1898, the TS gained the attention of many scientists worldwide, who studied it from different disciplines' points of view. Among these, medical and forensic studies played a major role in both understanding the TS itself and in diffusing information to the great public. Red stains on TS are indeed human blood (Heller & Adler, 1980; Baima Bollone, 1981, 1982), the TS is a burial cloth and the image it bears is that of a man with numerous wounds, ascribed to flagellation, coronation with thorns and crucifixion (see, for example, Baima Bollone, 1990 and Zugibe, 2005).

The death of the TSM has been taken as a matter of fact for thousands of years, and it has been confirmed from the characteristics of the body imprint by the first TS scientific researchers in the last century (Vignon, 1939; Barbet, 1954).

However, in 1960-70 Hans Naber, better known as Kurt Berna (1960, 1962, 1970), formulated the hypothesis of the survival of the TSM after the execution. As summarized by Baima Bollone in 1994, this hypothesis was based on a legend (fundament for the Islamic sect Ahmadyya) still diffused in Kashmir, telling that Jesus survived the crucifixion and, in the search for the lost 12 tribes of Israel, he migrated with Mary Magdalene and the apostle Thomas to this region where he settled down and he naturally died. His descendants would be still present in Kashmir. In Srinagar is located the Rozabal, an ancient temple keeping the tomb of Yus-Asaf, translation of the name Jesus. This legend has been diffused in Europe by an Andreas Faber-Kaiser's book published in

1976. The author indicated as his source Prof. F. M. Hassain, Head of the Kashmir History State Department, who went to Leh, ancient capital of Ladak, where he examined reports by German missionaries, who translated some Tibetan manuscripts telling the story of Jesus migration to India and Ladak. These manuscripts were a translation too, made by a Russian traveler, Nikolai Notovich. It is pretty evident that these were not first-hand information at all, and it would be almost impossible to verify them.

The "alive hypothesis" has been re-considered by R. Hoare (1981), K. Herbst (1992), H. Kersten (2001), H. Felzmann (2002, 2005) and M. Lorente (2007, 2008) renewing the old controversy, but without furnishing convincing evidences. In fact, these works base their claims on very few scientific data and the relative deductions are mostly of a subjective type.

For example, K. Herbst mainly based his claim on the opinion of the forensic pathologist Prof. W. Bonte from Düsseldorf, who proposed an apparent-death status, or coma, for the TSM from his very preliminary observations and conclusions on the amount of blood, bloodstain patterns, and presumed absence of "rigor mortis" only by looking at a small photograph of the TS. W. Bonte interpreted the "considerable" amount of blood coming out of the spear wound as a sign of "blood circulation activity not yet terminated in the grave" (in Kersten, 2001), forgetting all the signs on the TS attesting the death of the TSM.

The correct method to cope with the hypothetical survival of the TSM should instead analyze the TS image and its bloodstains in detail from a medical, anatomic-pathological and general perspective, taking into account the whole body of knowledge about the TS without forgetting details against the thesis that has to be demonstrated.

Numerous authors have dealt with the medical (but not only) aspects of TS image and, to a different extent, they met the problem of the effective death of the subject (see for example Fanti, 2008). The conclusions were uniformly in favor of a corpse enveloped into the TS.

The aim of this work is to make a brief review of those studies and their conclusions and to add some new evidences of the TSM death. An experimental test to quantitatively estimate the total amount of blood staining the TS has also been done, in order to demonstrate to the supporters of the "alive hypothesis" that the blood quantity contained in the TS is minimal and surely compatible with a corpse.

As a result, a clear and updated answer to the "dead-or-alive" controversy is shown.

## **2. MEDICAL EXPERTISE ON THE TS**

The following description of forensic and medical data should be read as presented by experts at a judicial hearing. No personal beliefs enter into the evaluation of the evidence. No sources aside from the burial cloths (TS and Oviedo Sudarium) are considered.

The only one assumption that has been made regards the fact that, in agreement with the work of many scholars, both the TS and the Oviedo Sudarium covered the same body. The Sudarium of Oviedo, is a bloodstained cloth, without body images, measuring 84 x 53 cm, kept in the Camara Santa of the Cathedral of San Salvador, Oviedo, Spain. The most important physical evidence of a connection between the two Relics is that the material of the cloth is identical, although there are differences in the manner of weaving. The Oviedo Sudarium is most probably a testimony to the death of the TSM, since bloodstain matching indicates that both cloths covered the same face.

Summing up the consequences of the data presented here below, from a rational scientific and forensic viewpoint, it is certain beyond any reasonable doubt that the TS did envelop a dead human body.

## **2.1 Surgical Considerations**

- The liquid that flowed from the wound on the right side of the chest, at the fifth inter-costal space, was a mixture of blood and serum. This means that the blood had remained for some time in the pleural cavity (hemothorax) and that it entered that space before the spear blow caused it to drain out. Otherwise, if the spear wound were the only reason for the flow, blood alone would have come out.
- It is well known that a blood sample at rest, in a test tube, will separate by sedimentation into the heavier cells that fall to the bottom and a clear serum that remains on top. In order for this to happen, the blood **MUST** be at rest.
- This means that the crucified victim, when hit by the Roman spear, had been dead for a sufficient period of time, without the respiratory motions that would have rendered impossible the physical separation of cells and serum. We might still hypothesize the almost impossible supposition that the victim was alive when the spear blow was delivered. In that case a wound of the type and size observed in the TS would cause –due to differences in pressure– a massive inflow of air into the pleural cavity ("pneumothorax"), with a mixture of blood from the wound itself ("pneumo-hemothorax"). With the large wound remaining open, the effect would be a "paradoxical" respiration, that is a cause of death if not treated immediately.

## **2.2 Forensic Analysis**

- The TS image indicates a perfect immobility of the human body wrapped in it: the very detailed image would be impossible otherwise.
- The facial image shows the typical "Facies Hipocratica" of a corpse. The apparent age of the subject would be estimated at about 40-45 years, due perhaps to dehydration and a lengthy life of exposure to open air conditions.
- The body shows an extreme rigidity, producing an S shape with the head bent towards the chest, and the chest towards the abdomen. The chest is shown in an intense inhaling contraction, the abdomen protruding outwards, and the legs half bent, still retaining the asymmetry caused by their position on the cross.
- There are bloodstains due to human blood, from wounds inflicted upon a living person and also "post mortem" flows. The side wound is certainly "post mortem": the edges of the wound are clearly undulated, since they did not retract as would be the case if the subject were alive when the blow was inflicted. Blood clots and serum are clearly separated, so that compared with blood seen on the arms they seem lacking in structure. This is true for the stains in the lower part of the wound, and in the flow that crosses the back, that occurred about two hours after death.

The Oviedo Sudarium, thoroughly studied by the members of the EDICES group in Spain, shows that the blood imprints are due to contact with the head of a person who died in a vertical position and remained so for about an hour, with the head bent about 70 degrees forward and 20 degrees to the right. The corpse was then placed prone towards the right, the head still bent 20 degrees towards the right and 115 degrees forward, with the forehead resting upon a hard surface, and remained in this position for about one hour more. The body was later moved while a male hand tried to suppress the flow of a liquid (blood and serum) from the nose. The body was finally laid, supine, while the Sudarium was removed.

It is obvious that the subject had to be dead, since the formation of the stains is incompatible with any breathing motion over a period of more than two hours. The bloody flows from mouth and nose prove that the heart had stopped, as well as the lack of breathing.

This cloth also clearly shows the difference between blood from a living body and large "post mortem" flows. Just as in the case of the TS, an absolute immobility was necessary during the whole period when the stains were formed.

### **3. A DEBATABLE HYPOTHESIS: "THE TSM WAS ALIVE"**

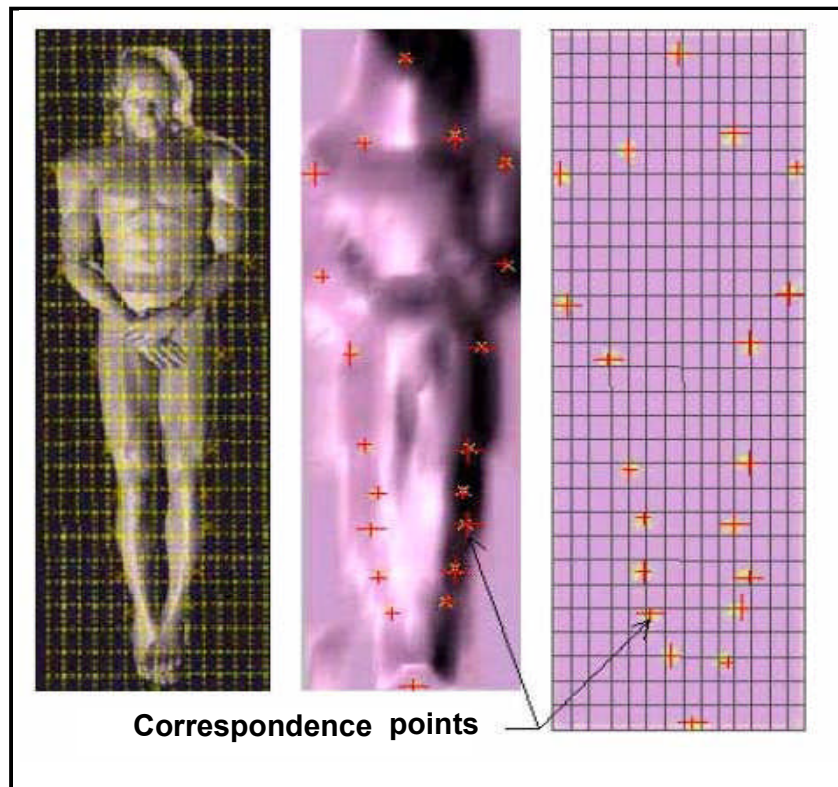
Some scholars state that these following "evidences" reveal the survival of the TSM in the grave; each statement will be discussed in Section 5 with the support of experimental results.

- 1) The body within the TS was not rigid. In fact the head could be bent because a pillow had been placed under, and there is no sign of rigidity for hands and feet.
- 2) The side wound show repeated bleeding and would reveal that the blood circulation was still active.
- 3) A similar phenomenon is found for the blood of the crown of thorns.
- 4) The amount of blood is too much for a corpse, because corpses normally do not bleed.
- 5) Wrist blood stains could not be formed on the cross. The man was alive in the grave and the two rivulet directions could correspond to the belly movements during breathing.
- 6) A spear entering the chest of a crucified person in the place where the side wound is would not hit the heart.
- 7) The TSM was in a comatose condition. Then he was taken down from the cross and buried, and after a brief period of recovery he woke up and went out.

All these points have been debated and answers will be listed here below, on the base of what TS data reveal.

### **4. THE TS ENVELOPED A REAL HUMAN BODY**

In the case of the TS the body is missing, but we have an image left on it. The frontal image is 195 cm long, whereas the dorsal image is 202 cm (measurements done before 2002 intervention), and it could be doubtful that both have been produced by the same body.



*Fig.1. Computerized mannequin and correspondence points to fit with anthropometric parameters of the TSM image (from Basso et al., 2000).*

Recently (2000) Basso et al. demonstrated the compatibility of the frontal and dorsal image with a human body. A computerized mannequin which could be moved according to all movements allowed to a human body has been built, and it has been enveloped by a numerical sheet, simulating the TS. On this sheet the main anthropometrical points of both frontal and dorsal image were reported (Fig.1). By changing iteratively its height, position and dimensions, the mannequin was moved in order to fit its anthropometric parameters with that of the TSM reported on the virtual sheet.

It resulted that both TS images are compatible with the enveloping of a man  $175 \pm 2$  cm tall having a position similar to that of a crucified man, with the exception of arms that were crossed over the belly probably during the transportation to the tomb.

## 5. EVIDENCES FOR DEATH

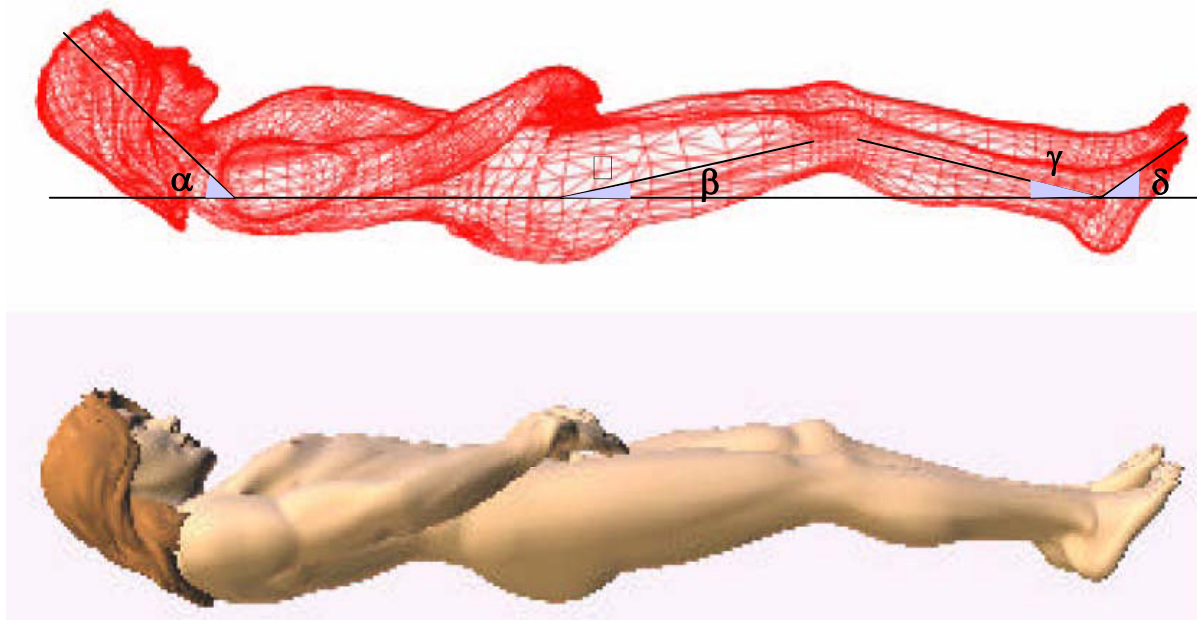
The claims reported in Section 3 are here considered and discussed also in reference to experimental results, showing their lack of a reasonable base.

### 5.1) Rigor Mortis

*Comment to § 3.1. Was the body within the TS not rigid?*

In the work of Basso et al. (2000) mentioned above, to fit the TS imprint their computerized mannequin had to be moved into a very peculiar position, as can be seen in Fig.2.

The asymmetrical bending of knees ( $\alpha$  and  $\beta$  angles), the unnatural bending of ankles ( $\delta$  angle) leading to an almost flat position of the right footprint, and the absence of flattening in the buttocks area (which is typical in a lying subject) are remarkable and only compatible with an extreme rigidity in a human body.



*Fig. 2: Reconstruction of TSM position within the linen sheet (from Basso et al., 2000).*

*See text for explanation of angles ( $\alpha$ ,  $\beta$  and  $\delta$ )*

This position has been achieved most probably on the cross, where the head was freely hanging down ( $\alpha$  angle); it has been fixed by rigor mortis and maintained after deposition, but for the arms,

which also show a certain degree of stiffness but were probably forced down the pelvis during burial operations.

Cadaveric stiffness has been recognized also by many Authors, for example Barbet (1954), (Baima Bollone, 1990, 1994, 2000), Coppini (1992), Zugibe (2005). People who die of a violent death, in particular one implying great muscular efforts, show a development of rigor mortis which is particularly rapid and strong (Baima Bollone, 1994; Zugibe, 2005) just as we observe for the TSM. Rigor mortis is universally considered by medical science as a sign of death.

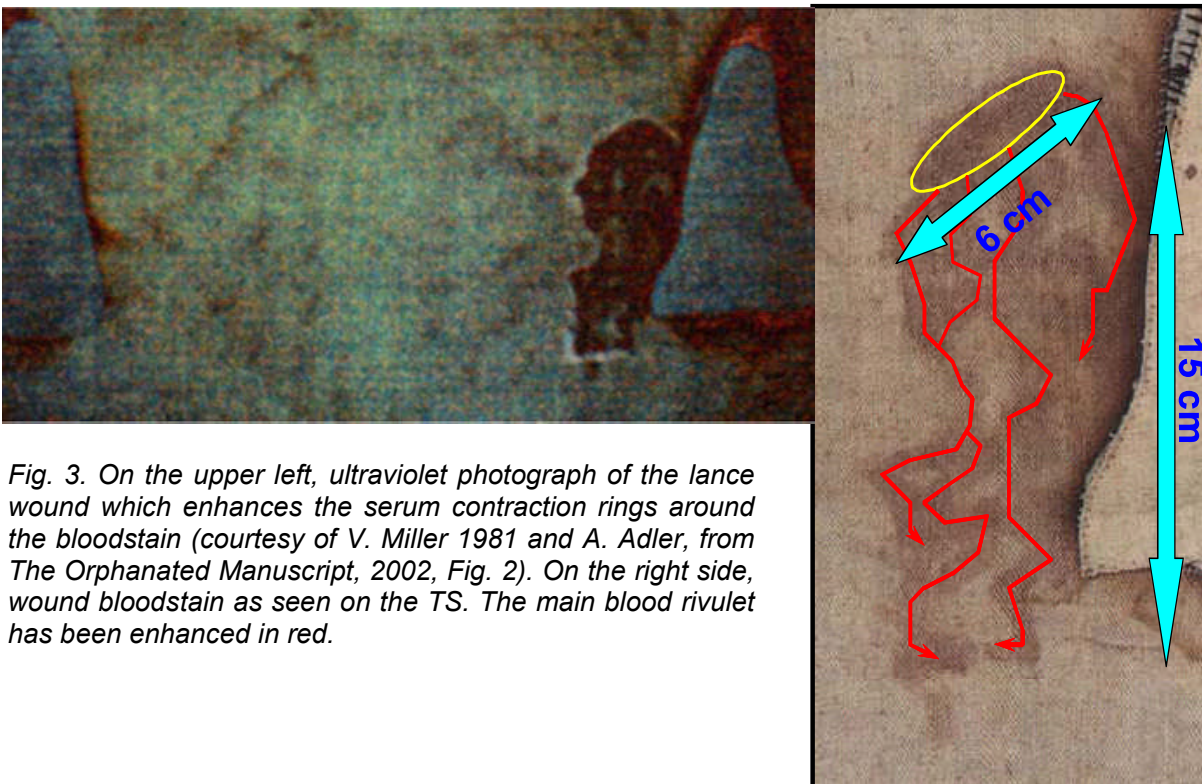
## **5.2 The separated blood of the side wound**

*Comment to § 3.2. Would the side wound reveal that the blood circulation was still active?*

The side wound resulted from a blow with a sharp instrument, like a spear, driven through the 5<sup>th</sup> intercostal space (Barbet, 1954; 1970; Baima Bollone, 1990, 2000).

It consists of an oval, elongated mark (4 x 1.5 cm, Fig. 3, in yellow) corresponding to the area where the spear entered, plus a bloody outflow 6 cm wide and 15 cm long. The injury shows that the skin has been sharply cut, having pointed extremities and rectilinear wide open lips as if the damaging agent had deeply penetrated (Baima Bollone, 1994). The wound does not show signs of vital retraction, as should happen in the case of a living person, and the blow must have been inflicted on a corpse (Baima Bollone, 1990, 1994, 2000; Zugibe, 2005).

The outflow is composed of some rivulets of red liquid (blood) plus a clearer liquid (serum), as revealed by UV photos (made by G.B. Judica Cordiglia 1988 and V. Miller 1981). See Fig. 3 and the graphic elaboration of TS high resolution photos (Bedon et al., 2008). Such kind of stain is possible if internal body structures have been wounded. In addition Baima Bollone (1994) observes that wounds of a living person bleed actively, whereas this outflow has all the characteristics of a passive drainage.



*Fig. 3. On the upper left, ultraviolet photograph of the lance wound which enhances the serum contraction rings around the bloodstain (courtesy of V. Miller 1981 and A. Adler, from The Orphanated Manuscript, 2002, Fig. 2). On the right side, wound bloodstain as seen on the TS. The main blood rivulet has been enhanced in red.*

A possible source for the blood is liquid accumulation "in situ" (within the thoracic cavity) and subsequent separation of its components after a hemopericardium (most probable), a hemothorax (Baima Bollone, 1990; 2000) or a huge thoracic trauma (Battaglini, 1987, 1990; Pisano, 1991).

The blood separation into its components is considered a sign of death, because the blood must rest still for a certain period of time and blood circulation must be obviously stopped to allow it (Baima Bollone, 1994, and references therein, Zugibe, 2005).

The repeated bleeding of this wound does not mean that the heart was beating and the man was alive, but can be easily explained by passive flowing of blood during body transport (Baima Bollone, 1990, 1994; Coppini, 1992), probably responsible also for the "blood belt" on the dorsal image.

Another opinion is that blood was over pressured in the thoracic cavity and, when the spear penetrated, it squirted out violently staining the skin with more than one single flow (Battaglini 1990).

### **5.3 Blood on the head redissolved by fibrinolysis**

*Comment to § 3.3. Is a similar explanation needed for the blood of the crown of thorns?*

Blood traces on the head, and many blood traces staining the TS, have been formed thanks to "fibrinolysis"; this process allows the transfer of blood from the skin to a linen sheet and it happens in a period of time of less than 36 hours (Brillante, 1981; Brillante et al., 2002). When put within the TS, the TSM blood was probably dry, as blood normally dries fast in open air conditions so that, to stain the linen, blood crusts must have been re-dissolved when the body was inside the humid TS.



*Fig. 4: Head bloodstains as seen on the dorsal TS image.*

The blood on the head (classically related to the crown of thorns, Fig. 4) came out when the TSM was alive before being buried (Coppini, 1987). Then it dried on the hair and, by fibrinolysis, it was transposed to the TS during the time of permanence within the grave.

#### **5.4 Amount of blood on the TS: experimental results**

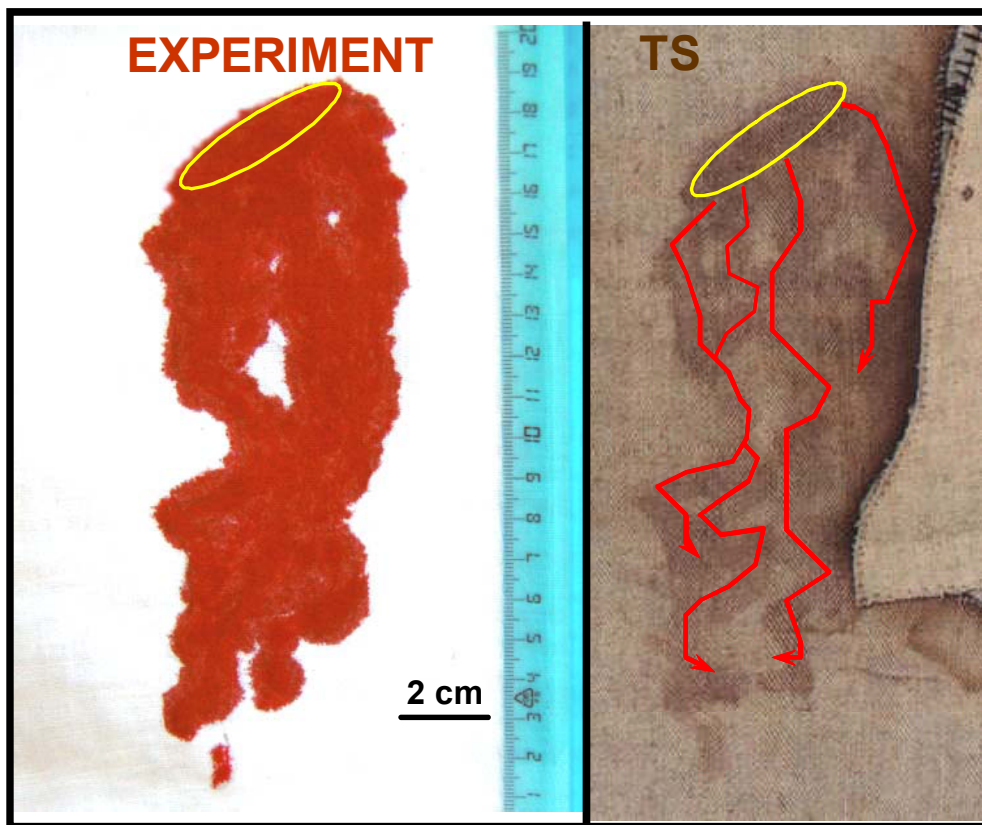
*Comment to § 3.4. Is the amount of blood too large for a corpse?*

A point dearest to people sustaining the "alive hypothesis" calls into question the amount of blood observed on the TS. According to them, it is too much for a corpse, because corpses normally do not bleed, and, since all the blood accumulate in the lower part of the lying body according to gravity, it would be impossible for wounds located in the upper part to bleed.

The following experiments have been done to estimate the amount of blood necessary to produce some TS blood stains.

##### ***5.4a Reproduction of the side wound***

A blood-like liquid consisting in a mixture of 1/2 water and 1/2 hydro-soluble color has been poured on a linen sheet using a syringe to "paint" the TS side wound (Fig. 5).



*Fig. 5: Experimental reproduction of the side wound bloodstains.*

Beside the difference in the type of resulting stain (much of the blood on the TS is transferred by fibrinolysis), a quantitative estimation of the needed liquid can be done.

-The quantity used is 3.0 ml.

Comparing the two photographs of Fig. 5, it is clear that the amount of liquid used in the experiment is excessive with respect to the quantity of blood staining the TS. The consequence is that the side wound resulted in a transfer of a blood amount smaller than 3.0 ml.

#### **5.4b Reproduction of the blood belt**

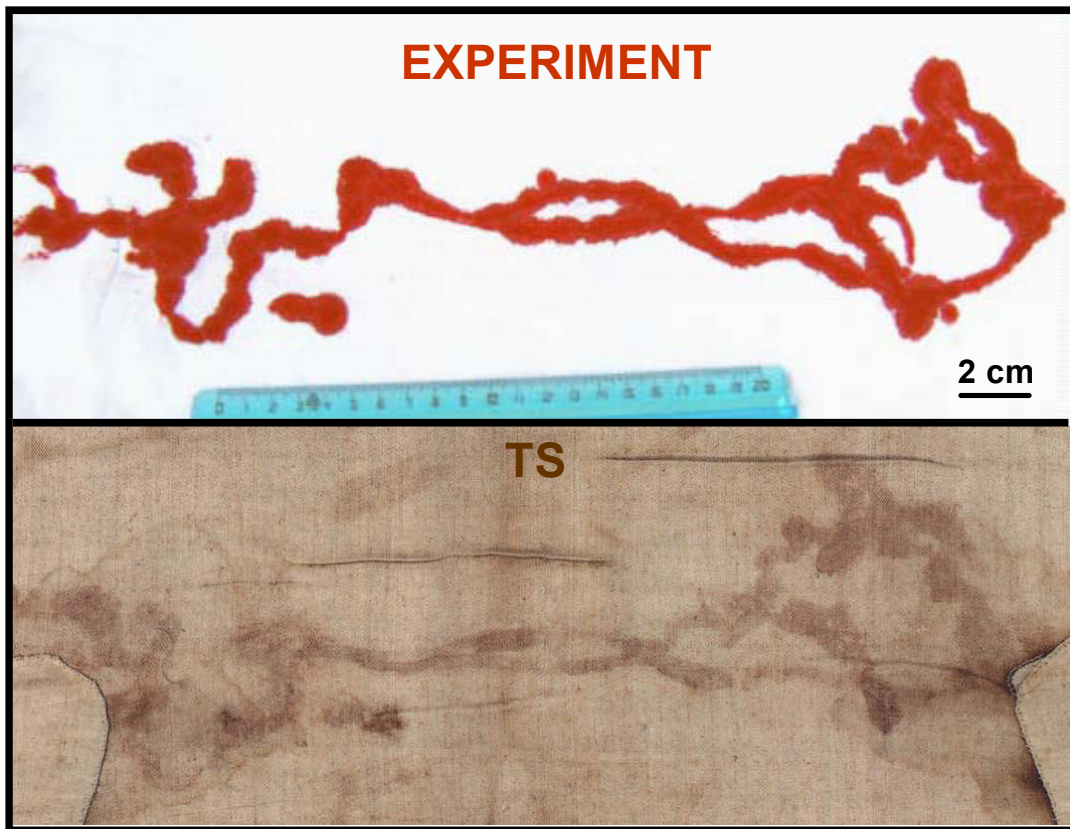
A similar approach has been used to reproduce the "blood belt" (Fig. 6).

-In this case the quantity of liquid used is 2.8 ml.

According to the results of these experiments, the total amount of the blood visible on the TS has been tentatively evaluated.

-The total amount of the TS blood is  $25 \pm 10$  ml.

This quantity is negligible with respect to the 5000 ml of a human body, so the statement that there is too much blood on the TS is unwarranted.



*Fig. 6: Experimental reproduction of the "blood belt" stains.*

#### **5.5 Wrist bloodstain pattern**

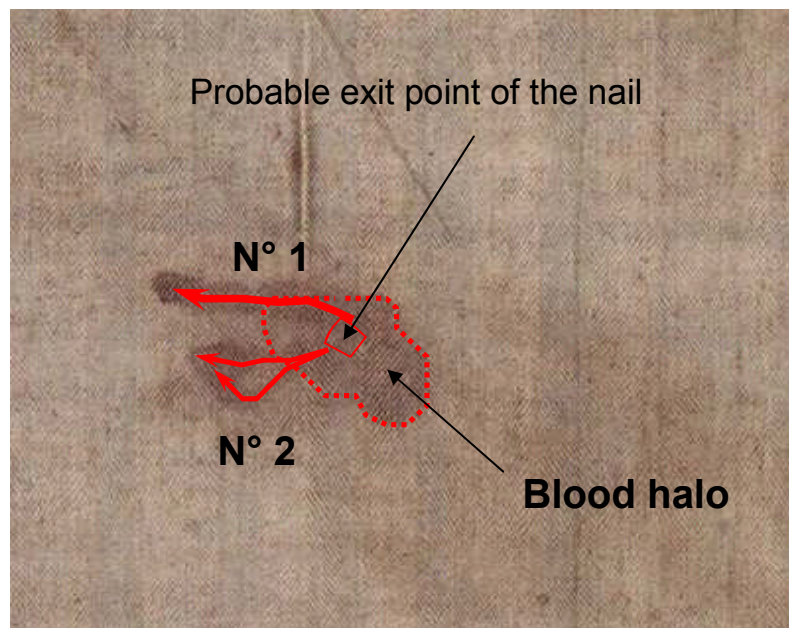
*Comment to § 3.5. Couldn't the wrist blood stains have been formed on the cross?*

The wrist bloodstain is composed by two or three rivulets (n° 1 is sharp, n° 2 is thicker and probably composed by two thin flows, Fig. 7) overlapping a bloody halo whose color is shading to a lighter red tone. This can also be better appreciated through the graphic image processing of Bedon et al. (2008).

The blood halo could have been formed during different time instants such as, for example, the nailing operations when the body laid on the ground. The two rivulets were perhaps originated on the cross in the space between the wrist and the cross, but they could have been formed also when the TSM was moved from the cross to the sepulcher (Zugibe, 2005) or when the TSM's arms were repositioned.

The assumption of the "alive hypothesis" supporters that, if fixed to the wood, the wrist would cause only a smearing of the trace is debatable. The body weight would pull the wrist downward but even outward, so a little space would result between the wrist and the cross wood, allowing blood flows. The nail indeed would probably not be totally driven but some space would be left between the head of the nail and the skin to ease the removal after the execution. Moreover, the arching movement of the victim (Zugibe, 2005) would cause further enlargement of this space.

To conclude, whether they formed on the cross or during body displacement/transport, wrist bloodstains are not a sign that the TSM was alive.



*Fig. 7: Wrist bloodstains as visible on the TS. Rivulets and halos have been enhanced for clarity.*

### **5.6 A fatal blow**

*Comment to § 3.6. A spear entering the chest of a crucified man would not hit the heart?*

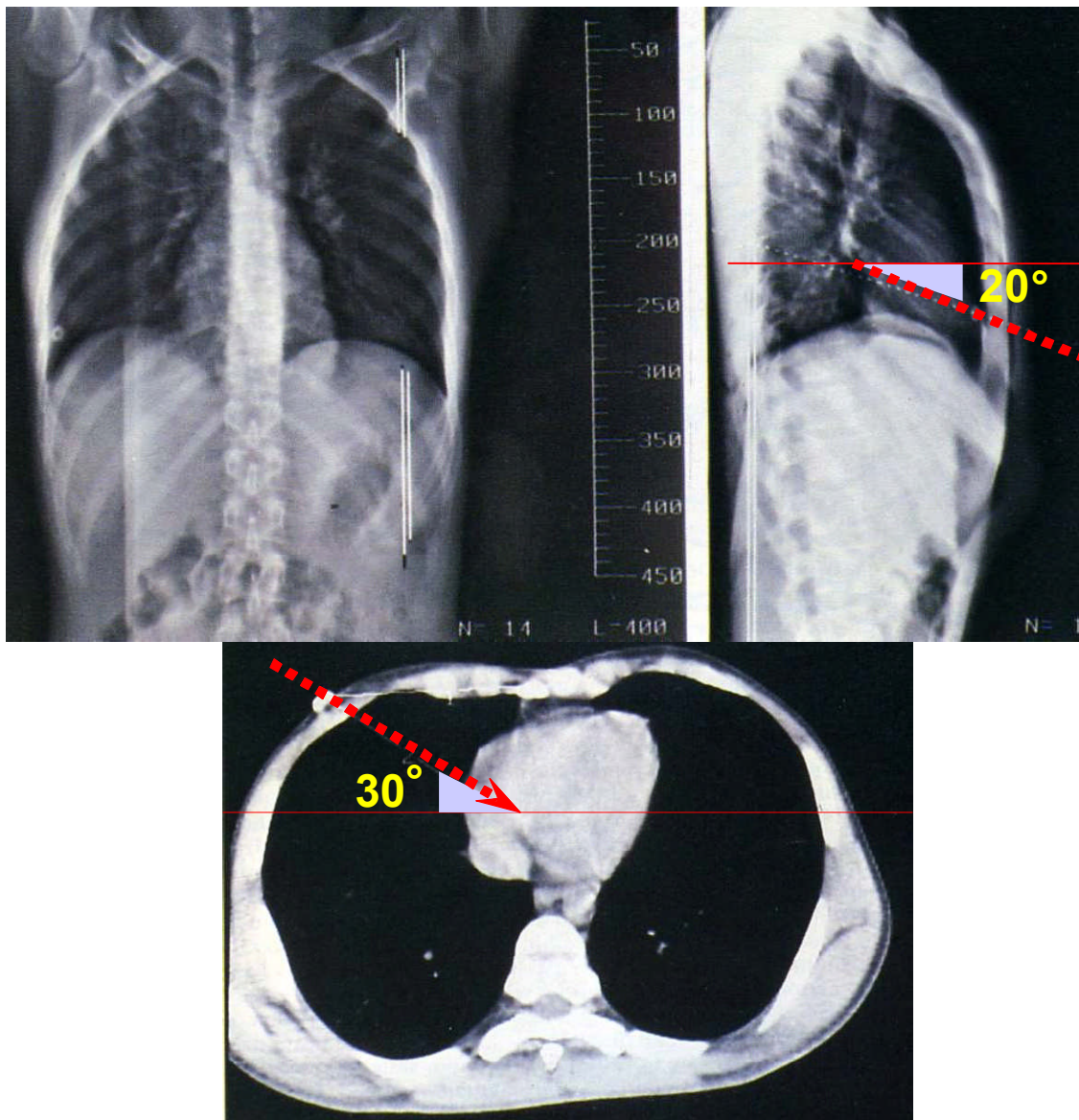
Already in the second half of the last century Barbet concluded from his experiments that a spear blow like that observed on the TS reaches the heart of the victim (Barbet, 1954).

In more recent times Baima Bollone took part on this discussion leaving the question open (1990); in his opinion the spear could have or could have not hit the heart, but in any case it would have caused deadly damage to the lungs. Such a perforation causes the entering of air in the thoracic cavity causing a pneumothorax, especially if the subject is suspended by the arms, and the collapse of the lungs. If not treated immediately it leads to death by anoxia and septicemia in a short time (Baima Bollone, 1994; 2000).

Coppini (1987) reached similar conclusions and went further with an experiment. On a male volunteer with physical characteristics similar to those of TSM (180 cm tall, 77 kg heavy) the location of the side wound (5th inter-costal space) has been marked, and a CAT (Computerized Axial Tomography) has been performed on the subject while he was lying in a position similar to that assumed by a body during crucifixion. Thanks to the scanning he was able to check the journey of the spear within the body (Fig. 8).

A spear blow entering with a lateral inclination of about 30-35° and a horizontal inclination of 20° reaches the right atrium of the heart after a path of only 8 -10 cm .

In conclusion, the spear blow is a sufficient and sure cause of death.



*Fig. 8: CAT image showing the most probable path of a spear within a crucified body (from Coppini, 1987)*

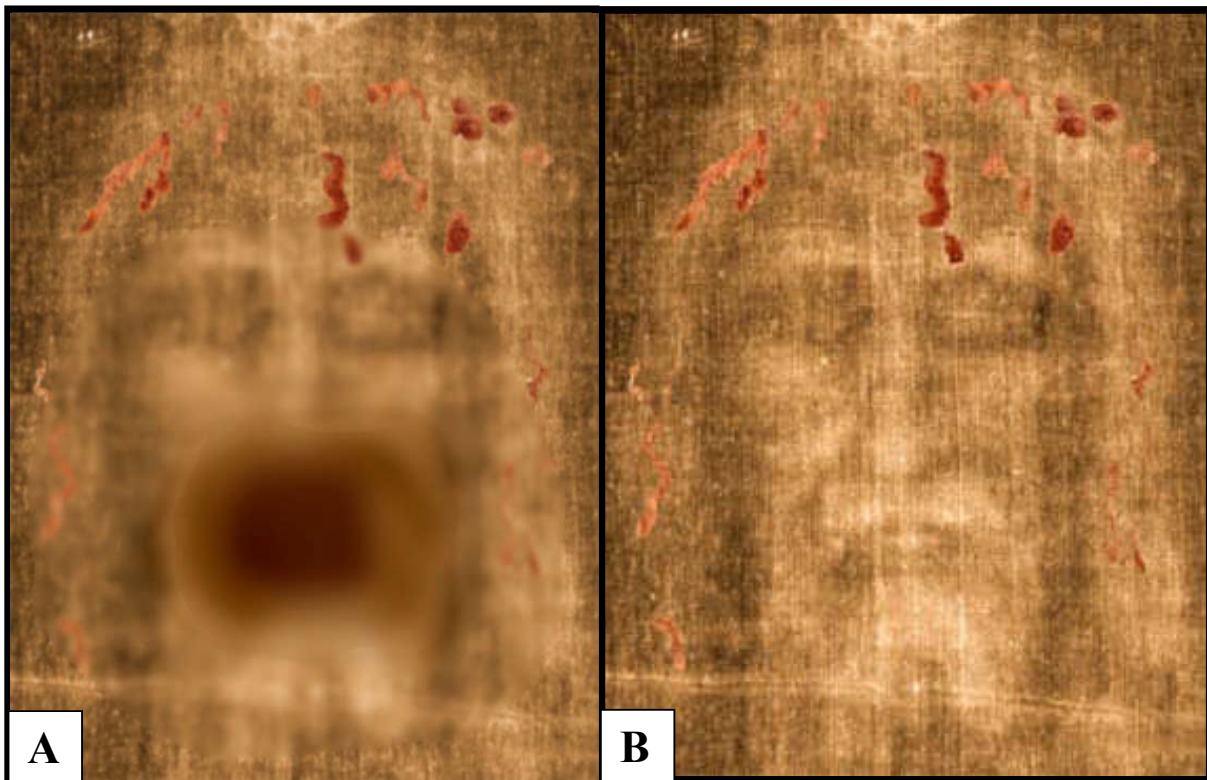
### **5.7 Other signs of death**

*Comment to § 3.7. Did the TSM, after a brief period of recovery, wake up and go out?*

#### **5.7a No signs of gas exhalation on face image**

If the TSM was alive, he would breathe under the linen sheet. The exhalation of CO<sub>2</sub>, H<sub>2</sub>O and other gases is expected to cause some halos in the mouth and nose area. Wetting of linen threads would have acted as a shielding during the image formation process, and therefore the resulting image would have been different here with respect to the rest of the body. If, for example, the body image formed during a burst of energy connected with Corona Discharge (Fanti et al. 2005, Fanti 2008), the humidity on the TS threads could have masked the imaging process (Fig. 9).

The resolution of  $4.9 \pm 0.5$  mm found by Fanti (2008) would also probably not be found in this area, and a big halo would be registered in correspondence of the nose and mouth, as shown in Fig. 9, whatever image formation process took place. The face area in the TS image is one of those with the highest resolution: this is exactly the opposite of what is expected if the man were alive.



*Fig. 9: Face of the TSM. A: as it could look like if the man was breathing; B: as seen on the TS.*

#### **5.7b No movements due to breathing**

If the TSM was alive, he would breathe under the linen sheet, so a movement would be expected at least in the areas of the chest, belly and hands which are crossed over the pelvis.

This movement would constitute an obstacle during image formation if the reaction lasted for more than a minute, because the image would again be blurred and resolution would be much lower especially in correspondence to the hands (Fig. 10). In contrast to this fact, the hands area (together with the face) shows the best resolution of the body image.



*Fig. 10: Hands area as seen on the TS.*

#### **5.7c No smears in the bloodstains**

The bloodstains do not show any smear or crusts breaking (Marinelli, 1996, Stevenson, 1999), as would be expected if the TSM went physically out of the TS enveloping his body.

The TSM “went out from the TS” in an inexplicable manner, he “disappeared”, but not as a living man would have done waking up.

#### **5.7d The impossibility of breathing**

Even under a thin linen sheet, It is very difficult to breathe sufficiently for a period longer than 10 minutes. A wounded man like the TSM would asphyxiate after a short time of permanence within the TS if he were alive!



*Fig. 11: Possible wrapping configuration of TSM.  
The quite tight face covering would render breathing very difficult.*

## **8. THEOLOGICAL CONSIDERATIONS**

To say that one can remain a Christian without accepting the true redemptive death of Christ on the Cross and his subsequent bodily Resurrection, is to totally miss the central tenets of the Faith. Christ is the definitive sacrifice, the true "Lamb of God who takes away the sins of the world", something that was prefigured in the Paschal Lamb and that remains as the only sacrifice of the New Covenant, made present again and again in each Eucharist. The true resurrection of Christ, with a new type of life "outside the limits of space and time", is the source of life for all those redeemed by his death, and it is the model and powerful force that will communicate life to those who rise from the dead as his members.

For witnessing to his Death and Resurrection, the Apostles gave their lives, as did numberless martyrs from the first century to our present day: they did not go to death because Christ walked out of the tomb to migrate to Kashmir or to any other fancy place invented without any critical support. The Apostles didn't just see a survival that seemed so unlikely that it was considered a miracle. They had seen miracles at the resurrection of Lazarus and the son of the Nain widow, but their experience of the risen Christ was totally new: they could see Him only when He wanted to be seen; they could touch Him and then He would suddenly cease to be within an enclosed room.

They gave their lives for the testimony of the Resurrection, even if they were laughed at and persecuted for doing so. And this was not a slow recovery after the Passion: Christ was brimming with this new life less than 48 hours after He was put in the tomb.

This is the Faith of Christianity for 2000 years, in spite of all the fancy proposals to water it down without a single datum of historical evidence. In the words of St. Paul, perfectly true today, "If Christ did not rise from the dead, our Faith is empty and we are the most miserable of men". If our Head did not conquer death by His resurrection, there is no hope for us when we die.

Finally, from the simple human viewpoint, when the soldiers went to guard the tomb and seal the door, they would be risking certain death if they were guarding an empty sepulchre, and on the third day the corpse were missing because it wasn't there when they were called to protect it against possible robbers. It is obvious that they would check that the body was there before they sealed the entrance, and neither the apostles nor Christ himself could have moved the heavy rolling stone and walked out with the guards doing nothing to prevent it. The whole hypothesis of the TSM alive is clearly absurd.

## **CONCLUSIONS**

The TS is a very complex object that is not easy to be understood especially if it is not approached with a multidisciplinary perspective. For this reason books, documents and even television documentaries frequently appear, stating wrong facts about the TS and thus greatly contributing to generate confusion among the public and promoting the spread of distorted ideas.

This is the case of Hans Naber (alias Kurt Berna) and his followers, who wrongly supposed a living man enveloped in the TS. The present work was done to explain why they were not right and to provide a rational answer to many doubts raised by the sustainers of the "alive-hypothesis".

Evident signs of death for the TSM are the following:

- Rigor mortis (for instance absence of flattening in the buttocks area) in a position compatible with that of a crucified man.
- Separated blood of the side wound; the separation is possible only if the circulatory activity has ceased.
- Many bloodstains are due to fibrinolysis and they were transferred from the skin onto the sheet in 30-40 hours.

- Experiments demonstrate that the amount of blood staining the TS is minimal ( $25 \pm 10$  ml), much less than what would be expected for a wounded living body.
- Experimental work demonstrates that the TS spear blow reached the heart penetrating the chest for 8-10 cm.
- A spear blow like that observed in the TS is always lethal, because it causes pneumothorax and lung collapse.
- No signs of breathing disturbed the face imaging process.
- No image blurring due to breathing appears in image area of the hands and arms.
- No smearing or rupture of the blood crusts. The body "disappeared" from the TS but it did not go out in a normal manner, as a human body waking up would have done.
- A wounded man enveloped in a sheet like the TS would probably asphyxiate in few minutes.

All TS evidences consistently demonstrate that the TSM was dead when enveloped in the TS burial cloth.

## REFERENCES

- Adler A. D. (2002): "The Orphaned Manuscript" Dorothy Crispino, ed., Effatà Editrice, Torino Italy,.
- Baima Bollone P. L., Jorio M., Massaro A. L. (1981). La dimostrazione della presenza di sangue umano sulla Sindone. Sindon, Quad. 30, 5-8.
- Baima Bollone P. L., Jorio M., Massaro A. L. (1982). Identificazione del gruppo delle tracce di sangue umano sulla Sindone. Sindon, Quad. 31, 5-9.
- Baima Bollone P. Sindone o no. S.E.I. Eds., Torino, 1990.
- Baima Bollone P. (1994) L'uomo della Sindone era cadavere. Sindon N. S., Quad. 7, 39-47.
- Baima Bollone P. Sindone. 101 domande e risposte. Edizioni San Paolo, 2000, 181 -187.
- Barbet P., The Passion of our Lord Jesus Christ. Clonmore and Reynolds Ltd., Dublin, 1954.
- Battaglini A. (1987). Ancora sulla frase giovannea "sangue ed acqua". Proceeding of the IV National Shroud Congress, Siracusa, October, 17-18, 101-106.
- Battaglini A. (1990). Ancora sulla frase giovannea "sangue ed acqua" (Nuova ipotesi sull'origine dell'acqua). Sindon N. S., Quad. 2, 25-31.
- Basso R., Bianchini G., Fanti G. (2000) Compatibilità fra immagine corporea digitalizzata e un manichino antropomorfo computerizzato. "Sindone 2000" International Congress, Orvieto, August, 27-29.
- Basso R., Fanti G. (2007): "Optics Research Applied to the Turin Shroud: Past, Present and Future" in Gallico P. V.: "Optics Research Trends", Nova Science Publisher Inc., New York.
- Basso R., Fanti G. (2008), "Resolution of Images Obtained Without an Acquisition System Using MTF", Int. Conf. on the Shroud of Turin "Perspectives of a Multifaceted Enigma", Columbus - Ohio August 14-17,.
- Bedon G., Linguanotto M., Simonato I., Zara F. (2008). Study of the bloodstains in the Shroud of Turin. International Congress "The Shroud of Turin: Perspectives on a Multifaceted Enigma". Columbus, Ohio, August, 14-17.
- Berna K. pseudonym of Hans Naber., " Jesus - Nicht am Kreuz gestorben", Stuttgart, Germany, 1962.
- Berna K. in Sindon Quad. n. 3 (agosto 1960) p. 40, "Fantasie eretichedi un visionario: Kurt Berna" Sindon, Quad. n. 4 (dicembre 1960), pp. 18-20; "Due verità da Kurt Berna", Sindon Quad. n. 14-15 (dicembre 1970), Torino, pp. 18-20.
- Brillante C. La fibrinolisi nella genesi delle impronte sindoniche. Proceedings of the II National Congress of Sindonology, Bologna 1981, CLUEB, Bologna 1983, 239-241.
- Bucklin, R., "A doctor at Calvary – the second opinion", Identification scientifique del l'Homme du linceul: Jésus de Nazareth", Actes du Symposium Scientifique International Rome 1993, C.I.E.L.T., O.E.I.L., F. X. De Guibert, Paris 1995, pp. 173-175.
- Coppini L., (1987) Le lesioni da punta ed il colpo di lancia visibili sulla Sindone. Rilievi di anatomia topografica e radiologica. Proceedings of the IV National Congress on the Holy Shroud, Siracusa, October 17-18, 74-91.

- Coppini L., (1992). Dall'annientamento della morte alla gloria della Risurrezione (I). Sindon N. S., Quad. 4, 49-57.
- Faber-Kaiser A. "Jesus vivio y murio en Chachemira". A. T. E.. Eds., 1976.
- Fanti G., Lattarulo F., Scheuermann O. (2005). Body image formation hypotheses based on corona discharge. Third Dallas International Conference on the Shroud of Turin. Dallas, Texas, September 8-11, <http://www.dim.unipd.it/fanti/corona.pdf>
- Fanti G. (2008): Body Image Formation Hypotheses Based on Corona Discharge: Discussion, Int. Conf. on the Shroud of Turin "Perspectives of a Multifaced Enigma": Columbus - Ohio August 14-17, 2008.
- Fanti G. (2008): MTF resolution of images obtained without an acquisition system, Int. Conf. on the Shroud of Turin "Perspectives of a Multifaced Enigma": Columbus - Ohio August 14-17, 2008.
- Fanti G., La Sindone. Una sfida alla scienza moderna. Aracne Eds., Padova, 2008.
- Felzmann H., Revolution in Christentum. Books on demand GmbH, 2002.
- Felzmann H., Müssen Christen anders glauben? Triga, 2005.
- Heller J. H. and Adler A. D. (1980). Blood on the Shroud of Turin. Applied Optics, Vol. 19, No. 16, 2742-2744.
- Herbst K., Kriminalfall Golgotha. Der Vatikan, das Turiner Grabtuch und der wirkliche Jesus. Econ V., Düsseldorf, 1992.
- Hoare R., "Interpreting the stains", "l'interpretazione delle macchie" in "La Sindone, Scienza e Fede", Atti del II Conv. Nazionale di Sindonologia, Bologna 1981, a cura di L. Coppini e F. Cavazzuti, CLUEB, Bologna 1983, pp.201-210; 211-221.
- Jackson J. P., "Does the Shroud of Turin show us the Resurrection?", Biblia y Fé, 1998.
- Judica Cordiglia G. B., "Ricerche ed indagini di laboratorio sulle fotografie eseguite nel 1969" in Atti del IV Congresso Nazionale di Studi sulla Sindone, 1987, Ed.Paoline, Cinisello Balsamo (MI) 1988, pp. 132-141.
- Kersten H., "Jesus lived in India", Penguin Books, India, 2001.
- Lorente M., 42 dias. Análisis forense de la crucifixion y la resurreccion de JesuCristo. Aguilar, 2007.
- Lorente M.. "A Global Forensic Analysis of the Elements of the Shroud of Turin: Compatibility Between the Evidences of Vitality and the Absence of Signs of Death on the Cloth " Int. Conf. on the Shroud of Turin", Perspectives of a Multifaceted Enigma", Columbus - Ohio August 14-17, 2008
- Kersten H. & Gruber E., "Das Jesuskomplott. Die Wahrheit über das Turiner Grabtuch". Langen-Müller, Monaco, 1992.
- Marinelli E. La Sindone. Un'immagine impossibile. San Paolo Eds., Cinisello Balsamo (Milano), 1996.
- Miller, V.D., Pellicori S.F, "Ultraviolet fluorescence photography of the Shroud of Turin" Journal of Biological Photography, Vol. 49, No. 3, July 1981, pp. 71-85.
- Pisano M. (1991). Il ruolo dei traumi toracici nella morte del crocifisso. Sindon N. S., Quad. 3, 57-67.
- Stevenson K. E. (1999): "Image of the Risen Christ", Frontier Research Pub. Inc., Toronto.
- Vignon P. (1939), Le Saint Suaire de Turin. Masson Eds.
- Zugibe F. T. (2005): The Crucifixion of Jesus: a Forensic Inquiry. M. Evans Publ.,.

## **APPENDIX**

During the conference Dr. Miguel Lorente made some other comments worth of note; this appendix discusses them.

### *A) M. Lorente's hypotheses of body image formation*

- 1) "*Chemical (Maillard's) reaction*".

According to some researcher (Basso 2007, Fanti 2008), some facts detected on the TS are not in agreement with this hypothesis, e.g. the low resolution reachable by means of this technique. Even if this reaction took place, it has no direct bearing upon the living or dead condition of the body. If anything can be said in this respect, it would rather imply a corpse, since it would require –for a natural process- a rather lengthy period of absolute immobility, incompatible with breathing or any other living process. If the reaction to produce the image were almost instantaneous (Jackson's [1998] and Fanti's [2008] hypotheses), it could not be attributed to any natural development of a living human body.

-2) *"Myrrh and aloe were used for both the human body and the cloth."*

Myrrh and aloes are mentioned in the Gospel, and they were meant to be used only with a corpse. There is no reason to attribute to them any healing power, and even less to expect that they would produce an immediate recovery from the terrible wounds of the scourging and the cross. According to STURP findings, no traces of aloe and myrrh were found on the TS.

-3) *"The blood stains reflect the handling or manipulation of the body during this process".*

The pattern of bloodstains is certainly compatible with the handling of the body when taken down from the cross and put in the tomb. It has to be expected. But nothing indicates that the handling occurred during or after the image forming process: no smearing or blood crusts rupture is seen.

-4) *"Source of amines for the Maillard's reaction was the rest of blood on the body surface after the wash".*

This subjective sentence, lacking of details, is in contrast with the evidence. Amines would be produced immediately after death from vapors coming out from the lungs, sweat and blood. Color intensity of the body image is not directly correlated with the amount of blood present in the same area, as it one would expected if blood were the determining factor for the image formation. For example the nose has the deepest color, but very little blood; the opposite is true in the chest wound and the feet.

#### *B) Supposed "absence of sign of death" and "evidence of vitality"?*

-1) *Stiffness.*

This means the state of muscular contraction and rigidity that sets in after death, due to the lack of ATP (Adenosin triphosphate). The amount of ATP in the muscles depends upon the previous muscular effort, that could deplete the glucogen that constitutes the chemical precursor of ATP. The TSM was already rigid when taken down from the cross, as shown by the position of the head, bent forward; by the position of the chest with the muscles in contraction; by the simultaneous contraction of the abdominal muscles and diaphragm (causing the upper part of the abdomen to appear depressed). The lumbar section of the spine is in a condition of lordosis, and the muscles of the buttocks are strongly evident, especially the left one (due to the greater flexure of the left hip, forced by the fact that the left knee is bent at about 20° as clearly seen in the TS). In general terms, the body has preserved the same position it had before death.

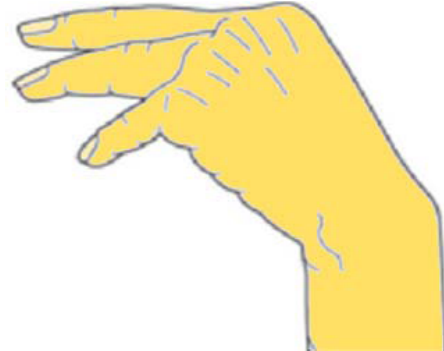
The "rigor mortis", in the case of a terribly violent death, sets in immediately and is very strong in its effects, just the opposite of what was affirmed by Dr. M. Lorente, and it is the result of muscular "destruction" by multiple injuries. The rigid body was not disturbed except to place the arms upon the pelvis, since the open arms -when nailed to the cross- were incompatible with a proper burial. The Brown-Sequard Syndrome (not "*Law*") deals only with the effect of a partial sectioning of the spinal cord and its effects on a living body: nothing applicable to this case.

-2) *Hypocalcemia.*

*Rhabdomyolysis* and the consequent *hypocalcemia* and *hyperpotasemia* will not cause any "rigor mortis": it will rather lead to certain death, since both conditions interfere with the proper functioning of the heart muscle fibers. The *myohemoglobin* released by broken cells will be carried by the blood to the kidneys, where its large size will block the microtubes that filter the liquids to deliver them to the urine. This will cause a kidney failure.

The supposed "Trousseau's sign" -that can occur only in a living organism -due to *hypocalcemia*, is totally different from the clear image of the hands as shown in the TS. It describes a rigidly bent wrist and the fingers brought together to a point in what is called an "obstetrician's hand", while in the TS we see the wrists quite straight and the fingers extended and parallel. See Figure A1 with explanation from a medical dictionary.

*Figure A1: Trousseau's sign is described as an indication of tetany, due to a Ca deficiency. It is induced –as a test- by compressing the upper arm for a few minutes. It shows as a bending forward of the wrist, while the metacarpophalangeal joints are flexed and all the fingers –including the thumb- come together in what is called an "obstetrician's hand". This is clearly unlike what we see in the TS image. There is no chance for error: both positions are incompatible.*



#### -3) Hypostasis.

In medical terms it indicates the pooling of body fluids in the lower parts of a corpse, left undisturbed under the action of gravitational forces. It is never applied to a living body; it produces a violet tinge in those low members that are not under pressure by contact with a supporting surface, and it is described as "post-mortem" lividity. To the extent that it is seen in the TS, it would be a proof of death.

#### -4) Temperature

There is no indication whatsoever of image intensity being related to temperature differences expected in a living body. In a typical photograph made with infrared-sensitive film (to detect temperature differences) the tip of the nose of a living human appears less marked (cooler) than the cheeks, just the opposite of what is seen in the TS.

### C) Conclusion

Dr. Miguel Lorente concluded as follows. "From a global forensic analysis there are elements of compatibility between the absence of signs of death and some evidences of vitality."

A medical doctor, if presented with the evidence found in the TS, would have given a report in terms such as: "After examining the body, I can certify that the person brought to my attention was a victim of multiple traumatic injuries that caused abundant hemorrhages and a hemothorax of the right side. As a consequence, he suffered an irreversible and multiple shock -nervous, toxic and hypovolemic- that caused his death, with an extra factor contributing to that final result: the mechanical respiratory insufficiency due to the strong hemothorax condition. A deep wound on the right side of the chest, without any retraction of the wound edges and with the emission of sedimentary blood clots, is a clear confirmation that the wound was inflicted on a corpse and not on a living body."

The American anatomo-pathologist Robert Bucklin (1995) sums up the description of "rigor mortis" that can be observed in the Shroud: "The body appears to be in a state of rigor mortis which is evidenced by an overall stiffness as well as specific alterations in the appearance of the lower extremities from the posterior aspects. The imprint of the right calf is much more distinct than that of

the left: the leg was rotated in such a way that the sole of the left foot rested on the ventral surface of the right foot, with resultant slight flexion of the left knee. That position was maintained after rigor mortis had developed"

D) Theological comment

In a radio interview (in Spanish), Dr. Miguel Lorente professed to be a believer in Christianity and that his faith is stronger without depending upon the historical fact of the Resurrection. This is simply to make faith a matter of choosing beliefs according to personal preferences and forgetting that Christianity is not a human philosophy or code of ethics, but the acceptance in our personal life of the theological tenets of Christ's teachings as transmitted through a Church to which He entrusted the role of teaching the nations under the guidance of the Holy Spirit.

One can deny the historical facts of Christ's life, death and resurrection, to consider Him simply a great Rabbi and model, but this is not enough to give us the source of divine life and the basis for a hope that transcends human existence on Earth.