

What the Shroud is and it is not
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In this paper I will summarize some of the studies and findings in which I have been involved in my 24 years of dedication to this cloth.

It IS NOT a “Sábana”. It IS NOT a “Sudario”.

“Sábana” and “Sudario” are names applied to the Shroud of Turin in Spanish. Neither one of them is the best way to describe the Shroud. It is a language problem only for Spanish speakers and it does not concern the English language.

IT IS a burial shroud

There are many aspects of the Shroud about which there is no agreement within the research community, especially regarding the image that the Shroud shows. But, with rare exceptions, it is generally accepted that this large linen sheet was used as a real shroud for a corpse that had suffered the punishment of flogging and crucifixion, both typical for the Roman style punishment of twenty centuries ago¹.

The presence of blood suggests a burial shroud. And the subsequent forensic study confirms the correspondence with the wounds due to a process of crucifixion, the crown of thorns, scourging and spear thrust on the side that the corpse suffered. The process and the elements used for torture correspond to the Roman practice. The pioneer of these forensic studies was the French Dr. Pierre Barbet whose findings were later confirmed, mostly by Drs. Bucklin² and Bollone³.

The identification of stains in the areas of the wounds as due to blood was determined firstly by Adler and Heller^{4,5}, and later confirmed by Bollone^{6,7,8}.

¹ RODRÍGUEZ ALMENAR, J. M. Et al, *La Sindone de Turín: Estudios y Aportaciones*. CES, Valencia, 1998.

² BUCKLIN R.: *The Shroud of Turin: Viewpoint of a Forensic Pathologist*, in Shroud Spectrum International, N.S., Dec (1982) and Legal Medicine annual, W.B. Saunders, Philadelphia, July (1982).

³ BAIMA BOLLONE P. L., MARINO C., PESCARMONA G.: “Il significato del colore delle macchie di sangue della Sindone ed il problema della bilirubina”, *Sindon Nuova Serie, Quaderno No. 15*, junio (2001), pp. 19-29.

⁴ HELLER J. H. and ADLER A. D.: “*Blood on the Shroud of Turin*”, in *Applied Optics*, Vol. 19, No. 16, August 15, (1980), pp. 2742-2744.

They identified vital blood and post mortem blood and also serum and other residues from incipient coagulation⁹. Tests were positive for protein, bilirubin, albumin, hemochromagen and porphyrin¹⁰.

The blood soaked through the tissue and passed to the opposite side, in contrast with the image which is visible only on the side that was in contact with the body. This is seen in the photos taken with lights shining through the cloth (transmitted light) and those of the "hidden face" that were taken in 2002 for conservation purposes (Figure 1).

If the Shroud did not have an image, but only biological stains, it would probably not have caused so much controversy. If it only were to show what is seen on the back or "hidden" side, no one would have argued that it was a painting, and most researchers would have considered it as a burial shroud without question.

It has been argued, however, that the presence of blood is inconsistent with the burial shroud of a Jew. It is claimed that the Jews are required to wash the corpses, and the shroud could not be the burial cloth of Jesus Christ because the Gospel of John says that Jesus was buried according to the custom of the Jews¹¹. But there is no inconsistency, for several reasons. One of them is that the prescribed ritual of preparing a deceased Jew for burial is a process that takes hours. The task list includes¹²:

- - Undress the deceased,
- - Prepare clean sheets,
- - Wash in warm water and cold water, not soaking the face, but only the sides,
- - Wipe,
- - Clean the finger nails and toe nails,
- - Cover the head of the deceased,
- - Then put on the underwear, and then his shirt and the rest,
- - Surround the waist and each ankle with bands and a specific number of knots, while those present count them,
- - Place the large sheet or *tachrichim* in the coffin protruding enough to cover the head,
- - Place the veil or *tallis* in the coffin sticking out enough to cover the deceased,
- - Place the deceased in the coffin,
- - Place shards over the closed eyes and mouth,
- - Sprinkle earth on the genital area,
- - Sprinkle earth on the shroud in which the deceased is wrapped,
- - Cover the deceased entirely,
- - Cover the coffin,

⁵ HELLER J. H. and ADLER A. D., "A Chemical Investigation of the Shroud of Turin" in Canadian Society of Forensic Science Journal 14 (1981), pp.81-103.

⁶ BAIMA BOLLONE P. L., JORIO M., A. L. MASSARO: "La dimostrazione della presenza di tracce di sangue umano sulla Sindone", in Sindon, Quaderno No. 30, Dicembre (1981), pp. 5-8.

⁷ BAIMA BOLLONE P. L., JORIO M., A. L. MASSARO: "Identificazione del gruppo delle tracce di sangue umano sulla Sindone", in Sindon, Quaderno No. 31, Dicembre (1982), pp. 5-9.

⁸ BAIMA BOLLONE P. L., "La presenza della mirra, dell'aloë e del sangue sulla Sindone", in: "La Sindone, Scienza e Fede", Atti del II Convegno Nazionale di Sindonologia, Bologna 1981, CLUEB, Bologna 1983, pp. 169-174.

⁹ FANTI G., MAGGIOLO R.: The double superficiality of the frontal image of the Turin Shroud. Journal of Optics A: Pure and Applied Optics 6: 491-503 (2004).

¹⁰ ADLER A.: "The nature of the Body Image on the Shroud of Turin", 1999, <http://www.shroud.com/pdfs/adler.pdf>

¹¹ Juan, 19:20.

¹² Tahara Guide for the Men's and Women's Chevra Kadisha of Congregation Kehilath Jeshurun www.jewish-funerals.org/sites/default/files/spiritweb/kjmanual.pdf

- - Recite the prayers provided at every step

The Gospel describes a situation where everything had to be done in a hurry, because the Sabbath rest was approaching (and there was no time to complete the whole process).

But what matters is that these rites apply to regular deaths of a patient in his bed of pain. For deaths with bloodshed there are other specific requirements. The same reference indicates that any venous drip with traces of blood, in the case of patients in hospitals, must be placed at the feet of the deceased in the coffin and buried with the corpse.

All these references are modern but they have their roots in the ancient traditions. Moreover, nowadays, when a terrorist attack happens in Israel with Jewish victims, members of ultra-orthodox sects come to the place of the attack even before the police arrives, and collect all the remains of the Jewish victims, even the blood. This is consistent with the exemption included in Jewish laws not to wash the lifeblood and to keep it with the corpse¹³.

It IS NOT the burial linens of Constantinople.

Since the cross, coming from Jerusalem, arrived in Constantinople in the year 638 many other relics of Christ joined it as time passed. By the time the crusaders attacked Constantinople, in the Pharos Chapel there was the most famous assortment of Christ's relics¹⁴: the cross, the nails, the sword, the sponge, the cane, the crown of thorns, the shroud, the sandals, the towel for drying the apostles' feet, the purple tunic, the sepulchre stone and a sudarium¹⁵. We note that the burial cloths (sindon and sudarium) are systematically mentioned in the inventories, among a list of relics, without saying anything about images on them.

Baldwin in 1238 had a shroud and many other relics. They were probably all preserved in the imperial Palace of Bucoleon during the attack in 1204. He sold them to his relative, Saint Louis¹⁶. The king of France was interested in collecting the relics from the Passion, and sent trustworthy people to the Byzantine capital to purchase them. Many Shroud investigators think the Shroud of Turin was exactly that found in the Imperial Palace and available for Baldwin. Very often the piece of shroud obtained by Saint Louis has been thought to belong to the Shroud today kept in Turin¹⁷.

Baldwin II sent a group of 22 relics from Constantinople to his relative Louis IX of France between 1239 and 1242:

1. - The crown of thorns as the most valuable
2. - A piece of the cross
3. - Blood of Christ

¹³ GANSFRIED S *Code of Jewish Law*, New York, Hebrew Publishing Company, 1927vol IV, ch. CXCIV. PP.99-100 Cited en. WILSON I y SCHWORTZ B. *The Turin Shroud. The Illustrated Evidence*. 2000 London. Michael O'Mara Books. P.44

¹⁴ MARTÍN J.L., *Las Cruzadas*. Cuadernos historia 16. n.140. p.28

¹⁵ Durand J et al. *Le trésor de la Sainte Chapelle*. Paris. 2001. Louvre pp 32-33
Riu M. *Historia de las Religiones Hispania* Sopena. 1965. p.604.
William of Tyre. Published by Savio. *Sindon* n. 3. p29

For Mesarites see too: A.-M. DUBARLE, *Histoire ancienne du linceul de Turin jusqu'au XIII siècle*, p. 40-41. Published in French by Celier O. *Le Signe du Linceul*. Cerf. Paris 1992. p38

¹⁶ De Gail. *Histoire du Linceul de Turin*

¹⁷ CORSINI, M. *Historia del Sudario de Cristo*, Rialp. Madrid 1988. p.63. SOLÉ M.. *La Sábana Santa de Turin* p.61. RAFFARD de BRIENNE D. *Le Secret du Saint Suaire*. Chiré 1993.p.52

4. - The nappies of the infant Jesus
5. - Another piece of the cross
6. - Blood from a picture of Christ
7. - The chain
8. - Sacred cloth inserted in a picture (Mandyllion)
9. - Stone from the tomb
10. - Milk of the Virgin Mary
11. - The spear
12. - A victorious cross
13. - The purple mantle
14. - The reed
15. - The sponge
16. - **A part of the shroud in which Christ's body was wrapped in the sepulchre**
17. - The towel used to dry the Apostles' feet
18. - Moses' rod
19. - A part of John the Baptist's head
20. - St. Blas' head
21. - St. Clement's head
22. - St. Simeon's head.

Except for the "milk of the Virgin", the other 21 were mentioned in the Pharos collection. Saint Louis had the Sainte Chapelle of Paris built to house these relics. He kept all of them inside a huge reliquary known as the "Grande Châsse". The Sainte Chapelle of Paris was plundered in 1789 during the French Revolution and almost all its contents were destroyed. However, there are enough documents with a good description of the contents. There are previous references about the relic collection housed in the Pharos Chapel inside the palace complex of Constantinople. If all the references are put together the whole list of relics fits very well with the collection of the Sainte Chapelle of Paris. Everything seems to point to Baldwin's taking them in their Byzantine reliquaries that he had in the chapel of Pharos, in the Great Imperial Palace of Bucoleon, and sending them to Louis¹⁸. Most of these relics were taken out their reliquaries and placed in new ones. Examples of the original reliquaries are saved in the Louvre Museum in Paris. The new gothic reliquaries were made of rich materials, with gold and silver and beautiful stones. They used transparent crystal that allowed seeing the relics inside, as was the case with the Byzantine reliquaries.

The funeral linens of the Bucoleon arrived in Paris in 1242. Among the 22 relics there was "*a part of the shroud in which Christ's body was wrapped in the sepulchre*"¹⁹. The expression is usually related to the linen cloth that Joseph of Arimathea used for Christ's burial, namely the Shroud. The French word used years later in inventories was "suaire". In any case, its size is well known according to representations and inventories of the "Grande Châsse" (Figure 3). The shroud was kept in a Gothic reliquary dating from the 13th century²⁰. It was a box of ~30 x 40 cm with a cover made of several crystal plates held by a golden grid with jewels. It was possible to see the contents through the cover. The back was made of gold or gilt, with a scene of Christ's life.

But Louis sent samples of his relic collection to several famous churches. Small parcels of these linens sent by Louis as a gift were preserved in different places and the one that

¹⁸ Durand J et al. *Le Tresor de la Sainte Chapele*. Paris. 2001. Louvre

¹⁹ *Partem sudarii quo involutum fuit corpus ejus in sepulchro*. Durand J et al. *Le tresor de la Sainte Chapelle*. Paris. 2001. Louvre p.50

²⁰ Durand J et al. Op. cit p87

arrived in Toledo (Spain) in 1248²¹ is the best documented. Together with the relics Louis sent a letter²² with a list of the collection²³. It consisted of:

- A piece of the cross (*de ligno crucis Domini*)
- A thorn of the crown (*spinis sacrosantae*)
- Milk of the Virgin Mary (*de lacte gloriosae Virginis Beatae Mariae*)
- The purple mantle (*de tunica Domini*)
- The towel used to dry the apostles' feet (*de linteo quo precinxit se Dominus*)
- **A part of the shroud in which His body lay in the tomb** (*de sindone, qua corpus ipsius sepultum iacuit in sepulchro*)
- A part of the Saviour's nappies (*de pannis infantiae Salvatoris*)

In the same letter he specifies the origin of the relics: all of them come from the imperial treasure of Constantinople (*de thesauro imperii constantinopolitani*). We can therefore believe that parts of the relics, which were first in Constantinople and then in the Sainte Chapelle of Paris, arrived in Toledo. Among them there was a part of the Shroud (*Syndone*) with which Jesus Christ's body was wrapped in the tomb. It is almost the same expression used by Baldwin in the authenticating letter but with the substitution of *Sudarii* for *Sindone*. A team of the "Centro Español de Sindonología" (CES) found in June 1998 the seven relics ascribed to Jesus Christ sent by Saint Louis. Three of the relics sent to Toledo were in their own specific reliquary and the rest were in the reliquary identified in several inventories as the "Saint Louis reliquary". In this latter one was the sample of the *Sindone*. It is a taffeta of 26 threads/cm in weft and 33 threads/cm in warp and S spin, made of linen (Figure 4). It could not be a piece of the Italian Shroud, which is a herringbone 3:1, 26x39 threads and Z spin.

COMPARISON OF TISSUES

| | Toledo | Turin |
|--------------------|---------|-------------|
| Texture | taffeta | herringbone |
| Fiber | flax | flax |
| Threads/cm. | 26 x 33 | 26 x 37 |
| Twist | S | Z |

The finding of Toledo in 1998 shows that the funerary shroud preserved in the Imperial Palace of Constantinople was not the Shroud of Turin. The fabric found in the reliquary of Toledo, which came from Constantinople, does not belong to the cloth of Turin.

Emperor Baldwin had a linen cloth that had been woven in the simplest way in taffeta, incompatible with the one in Turin. We do not know when the missing rectangles from the Shroud of Turin's corners were cut off. It is just as possible that they were cut before 1238 as more recently. Because of this finding there is now no reason to suppose that Baldwin II had the Shroud of Turin still in Constantinople in 1238. We therefore think that Baldwin

²¹ Cardenal Lorenzana. *Patrum toletanorum quotquot exstant opera*, t. III. Madrid 1793. Riant, Comte Paul. *Exuviae Sacrae Constantinopolitanae*. Génova 1877 Volumes I and II. Facsimile reproduced by Jannic Durand CTHS. 2004.

²² Following Sixto R. Parro. "Toledo in hand" 1857 p616-617, this letter has been stored in the Cathedral of Toledo. In 1976 there are news of its existence and location but we could not locate it nowadays. The Golden Seal of King was ripped apart and stored.

²³ Solé, M. Solé, M. About the fragment " *de Syndone qua corpus ejus sepultum jacuit in sepulchro* " gifted by S. Louis, King of France to the Cathedral of Toledo. II International Congress of Turin, 1978

used the Pharos collection, which did not contain, at this time, the Shroud of Turin. Our reasons are:

1.- In the Pharos chapel inside the Great Imperial Palace in Constantinople there was a collection of relics protected from the sacking. Baldwin sent them to Louis IX. Among them were the funerary cloths of Christ, with no image.

2.- Louis IX received his collection from the treasure of the Pharos chapel, showing a high agreement with the Sainte Chapelle collection, in which a shroud without image was included. He sent parts of these relics to Toledo.

3.- The most detailed description of the funerary cloth of the Great Imperial Palace includes the qualifying adjective of cheap²⁴, which fits much better with what has been found in Toledo than with the Shroud of Turin. The one in Toledo is a taffeta apparently without any treatment, while the one in Turin is a herringbone, of a much more complex manufacture.

4.- In the “Ochavo” of the Toledo Cathedral there is a reliquary with relics of Jesus Christ sent by Louis IX. Among them there is one mentioned as “de Sindone dni”.

5.- The portion of Shroud of Louis IX does not belong to the original Shroud located nowadays in Turin.

Was there in Constantinople another relic which could be a shroud as the Shroud of Turin?

It IS NOT (or It IS) the Mandilyon.

As proposed by Ian Wilson, the Shroud of Turin would be the Mandylion that came to Constantinople from Edessa (Urfa). According to the more usual interpretation, the Mandylion in Edessa was shown allowing only the face to be seen through a circular opening and the rest of the Shroud was folded and hidden behind, in a way that its dimensions were reduced to the total width of 1.1 m but the height was an eighth of its length (0.5 m) resulting in an elongated shape (Figure 5). So the pilgrims saw only the face.

In fact, in 944 AD, the Image of Edessa was moved to Constantinople and Constantine VII *Porphyrogenetos* describes all acts and processions held for its reception²⁵. And they tell us about its final placement in a chapel of the Imperial Palace. The Imperial Palace was a complex of buildings for residence, reception and worship similar to what today is the Kremlin in Moscow. The image was placed and kept permanently in the chapel of Pharos after its arrival from Edessa, joining the largest collection of relics of Christ that was preserved in this chapel and mentioned in the previous section. In this chapel the Image remained continuously. During the following centuries until the time of the Fourth Crusade, there was a succession of witnesses confirming the custody of the Image of Edessa in the Chapel of Pharos. It was called *manutergium*, *mantile*, towel, but there is no doubt that it is the image of Christ found on a cloth that came from Edessa.

I note the testimony that expressly indicates that it was kept in a box or reliquary. Especially interesting is the testimony of the Byzantine curator of the chapel of Pharos, Nicholas Mesarites, that speaks of the image on the cloth and on the tile²⁶. The tile was called *Keramión* and it accompanied the image of Edessa, also called Mandylion, in the chapel.

²⁴ MESARITES: A. en -M. DUBARLE, *Histoire ancienne du linceul de Turin jusqu'au XIII siècle*, p. 38.

²⁵ CONSTANTINO VII Porphyrogeneta. *History of the Image of Edessa*. Original in Greek. Translated into English in WILSON. I. *The Turin Shroud*.

²⁶ MESARITES: A. en -M. DUBARLE, *Histoire ancienne du linceul de Turin jusqu'au XIII siècle*, p38 Full text translated into French in DURAND J et al. Op. cit p. 29-30.

Figure 6 is a contemporary representation of both at the time of their arrival to Constantinople. The tradition claimed that this tile had miraculously received its image from the Mandylion

There is considerable consensus that the Shroud was in Constantinople and we also saw that the Image of Edessa was also in Constantinople.

But the Shroud can not be the Image of Edessa for 3 reasons that we will see.

There is enough detail of where the Image of Edessa was kept in Constantinople and Robert Clary in 1204 saw it in the Chapel of Pharos as expected²⁷. However, the very same Robert de Clary saw a "sydoines" in Blachernae, which was a chapel elsewhere in the opposite border of the city. This "sydoines" was a large cloth with the full figure of Christ. Most of us consider this "sydoines" as a firm testimony of the past of the Shroud of Turin.

But they were two different objects in two different places. Even if they were in the same city, they were in different places and the description provided by Robert de Clary of both objects is very different. In a place of honour in the chapel of Pharos, Robert Clary describes a towel (and therefore something of small size) with the face. It also describes the tile. In the other place in Blachernae, Robert Clary describes a "sydoines" which wrapped the body of Christ showing His image standing up²⁸. Robert Clary sees two distinct objects in two different places and describes them as very different. According to Robert Clary, the shroud can not be the Mandylion.

But there is another reason, much stronger. Holders of identifying the Shroud with the Mandylion insist on saying that the Mandylion disappeared from Constantinople after the Fourth Crusade. However, this is a claim contrary to the documented facts. What disappears, according to Robert Clary is the shroud of Blachernae. The Mandylion was kept in the Chapel of Pharos. In the Chapel of Pharos were kept also the relics of Christ. The Chapel of Pharos was not sacked. The relics of Christ were preserved from the looting and the Mandylion was also preserved from the looting in the Chapel of Pharos with the other relics of Christ. Soon after, it was sent together with these relics to St. Louis, King of France. The Mandylion was sent to Paris²⁹. They were 22 well-documented relics, among them the Mandylion, and one more named "*Sanctum toellam, tabulae insertum*".

St. Louis, Louis IX, built the Sainte Chapelle and he placed the collection of relics in a place of honour over the altar. There stood the Grande Châsse or Great Shrine. The arrival from Constantinople and the installation in the Sainte Chapelle is documented and recorded in inventories as the time passed with more or less detail. An inventory of 1740 gives a fairly accurate description and in it the Mandylion is called a reproduction of the Holy Face:

Reliquaire mesurant 22 pouces de long sur 15 de large (56cmx38cm). La boette est couverte de lames d'argent doré et garnie de quelques pierres précieuses. (Dedans) le fond est revêtu de lames d'or dans tout le contour et dans le milieu est la reproduction de la Sainte Face de Notre Seigneur

(Reliquary measuring 22 inches long by 15 wide (56cmx38cm). The box is covered with plates of silver gilt and garnished with a few gems. (Inside) the bottom is covered with plates of gold across the contour and in the medium is the reproduction of the Holy Face of Our Lord)

Other inventory called "Veronica" the Mandylion that showed the Holy Face.

²⁷ de CLARY. R. Op. cit p90.

²⁸ de CLARY. R. Op. cit p90.

²⁹ DURAND J et al Op. cit p. 70-71.

We see that the trajectory of the Mandylion is incompatible with that of the Shroud because the Mandylion, that came from Constantinople, remained uninterruptedly in the Sainte Chapelle until the French Revolution, and the Shroud, which is today in Turin, had already appeared in Lirey, then moved to Chambery, and finally to Turin.

The presence of the Mandylion of Edessa-Constantinople in the Sainte Chapelle is supported by the authority of the curator of the Louvre, Jannic Durand. He has used all the documents and archaeological objects to reconstruct the facts, and the result is the book "The Treasure of the Sainte Chapelle", developed by his team.

To avoid any doubt, I expressly asked him the question if the Mandylion had come to the Sainte Chapelle and I have his written answer: "*Le Mandylion de la Sainte-Chapelle est bien celui rapporté d'Edesse en 944 si l'on se fie aux documents en notre possession*" (The Mandylion of the Sainte-Chapelle is this brought from Edessa in 944, if we rely on the documents in our possession"³⁰)

So that the presence of the Mandylion in the Sainte Chapelle is the second compelling reason that prevents the Shroud to be the Mandylion. If the Mandylion was in Paris since the thirteenth century to the end of the eighteenth century, it could not be the Shroud, which by that time was in Turin.

The two previous reasons are from the "Letters" or "Humanities" branch. Now we will see a final reason from the branch of the "sciences" or "Experimental" data.

If we accept that the Shroud of Turin was kept in Edessa folded and showing only the face through a circular opening, the effect of the environment on the exposed part would have made a difference to the underside of the cloth, clearly visible to the naked eye. The circle around the face and the exposed area would be darker than the areas protected from the environment and it would be distinguished today on the Shroud of Turin (Figure 8). This is not just a conjecture because; we found this observable fact in the copy of the Shroud kept in Sanlucar de Barrameda. This copy was exposed for decades in a secondary altar in the church of Our Lady of Charity. It showed only the face and now the rectangle that was exposed is obvious when the whole cloth is deployed (Figure 9). The Shroud of Turin itself showed the difference between the exposed and the area protected from the environment in the reinforcement fabric, also called "the Holland cloth", after cutting the piece that was delivered to the Belgian textile expert Gilbert Raes after trimming the sample for the C14 dating (Figure 10). Therefore, nobody can argue that the Shroud today in Turin was exposed at Edessa in that way.

These are the reasons to deny that the Shroud of Turin and the Mandylion are the same object. At least these reasons should be used to present as a mere hypothesis the Mandylion like the old way of keeping the Shroud of Turin with important objections. It is a hypothesis far from being confirmed.

However, there are many researchers who have their arguments for thinking that the Mandylion and the Shroud were the same. In fact, I have to admit that it is practically the only hypothesis to propose a past for the Shroud of Turin. But how may they have been the same object and have followed different paths? We have to find an answer to the previous mentioned reasons for maintaining the identity of Shroud and Mandylion and that's what I'm going to try now. Maybe the key is the shrine.

We begin by ruling out that in Edessa some part of the cloth could be seen directly. We have to forget this setting. As we have seen, this is inconsistent with the hypothesis. But in

³⁰ Personal communication of 21st de December 2001

fact, it is likely that the Mandylion cloth was kept in a opaque reliquary. This is the rule of the Byzantine reliquaries. There are examples of this type of reliquaries preserved until now (Figure 11). The relic was not seen and was protected from the environment. What visitors would see in Edessa as well as in Constantinople would be a precious reliquary decorated with a drawing of Christ's face on the outside indicating its content. But they would not see anything inside. On the outside, there would be an image of the Christ's face in positive based on what appeared to be in the cloth inside. And the Mandylion representations that have survived would be, most likely, views of the exterior decoration. If so, we would have saved the physical argument of blackening of the part exposed to the environment.

In addition, if visitors saw the shrine, Robert Clary at Constantinople saw also the beautiful shrine as he says. Likely, he was told what was inside and the legend associated with it. But he never saw the cloth. This allows us to assume that in the Chapel of Pharos at the time of the Fourth Crusade, the magnificent reliquary of the Mandylion was preserved but EMPTY!

So, the second reason it would be saved was because the content could have gone to Blachernae. But the value and reputation of the Image of Edessa would have led to keep the memory³¹ of it, keeping and exposing their precious reliquary. There are examples in history for this kind of behaviour.

It must be assumed that the Mandylion was taken from his reliquary which stood in the chapel of Pharos and this empty shrine was send to Paris years later. The cloth with the image was taken to St. Mary of Blachernae at the other side of town to be displayed and shown to the faithful.

The Mandylion kept in Edessa in an opaque reliquary while keeping an empty reliquary in Constantinople is my contribution. It is what I propose to solve the problem.

In support of this idea, there is a curious fact that may reinforce this hypothesis. The vast majority of the relics that St. Louis received were taken out from their Byzantine reliquaries and relocated in new Gothic reliquaries with transparent lids. For example, we have the relic of the shroud which has been presented in the previous section. But the shrine of the Mandylion was, exceptionally, not replaced by the corresponding Gothic one, as happened with the rest. Perhaps the shrine itself was the entire relic...

So with the reliquary opaque and empty we would have answered the 3 objections.

Moreover, there is also a possible verification. We know the dimensions of the reliquary of Sainte Chapelle because they were recorded in an inventory. Its dimensions allow it to reasonably accommodate the Shroud of Turin when folded as shown in Figure 12. The transverse folds correspond to those occurring when the Shroud is folded successively by half and half and half. Some of these folds coincide with other known forms of preserving the Shroud. They are also common with assumed folds to justify the "*tetradiplon*". But the third longitudinal fold is quite unique. Maybe the experts on the Shroud creases could find evidence whether the Shroud today in Turin was folded this way.

Pending of finding more information and if we minimize the number of formulated hypothesis, one would conclude that the Shroud is probably NOT the Mandylion. But if we add the hypothesis of the opaque and empty reliquary, it COULD BE.

It IS NOT the shroud of Besançon

³¹ WILSON, Ian "*The Turin Shroud*". P171 y183

From the latest news from the Shroud in the East until the first news in Lirey there is a historical vacuum of about 150 years³². If the shroud that arrived at Lirey was first in Constantinople, how was it transferred from the Byzantine capital to the French Champagne?

Among other possibilities, one of the most widely supported is that the crusader Othon de la Roche sent it to France. This crusader, native of Franche-Comté in France, was appointed Lord of Athens for his leading role in the capture of Constantinople. Someone claims that Othon sent the shroud to his father, Pons de la Roche, and the father donated it in 1206 to the Archbishop of Besançon Amédée de Tramelay, who deposited it in the cathedral of St. Stephen. It is true that a shroud in Besançon attracted many pilgrims since the sixteenth century. However this shroud was destroyed during the French Revolution and, therefore, that shroud can not be the Shroud of Turin. Furthermore, if the Shroud venerated in Besançon had come from the Byzantine capital and remained there until the French Revolution, the shroud of Constantinople would not be that of Turin.

However, the version of a Byzantine origin of the Besançon shroud was actually presented about the late seventeenth century or early eighteenth century when a clergyman of Besançon and Dunod de Charnage³³, investigated the origin of the shroud which people worshiped by that time in Besançon. But we believe that this shroud was only a copy of the Shroud of Turin, in those days in Chambery, and we do not believe this Besançon copy had come from Constantinople. However, the Besançon shroud had already acquired quite a reputation at the time the authors mentioned wrote and this shroud attracted crowds of pilgrims. A confirmation of this popularity as well as the duplicity with the Chambery Shroud is found in the story of Fadrique, a pilgrim of Seville, who in 1520 passed through Chambery back from the Holy Land³⁴. The manuscript was found in the National Library of Madrid and released by D. Pedro Garcia Martin³⁵, Professor of Modern History at the Autonomous University of Madrid. It tells of the pilgrimage to Jerusalem of D. Fadrique Enriquez de Ribera, born in 1476 in a noble family. Here is what he tells us about the Shroud:

*"Otro día fuimos a comer a Chamberí, que está a legua y media. Esta ciudad es el principal lugar de la provincia de Saboya. Se extiende el Señorío del duque veinte leguas hasta la ciudad de Lyon. Aquí dicen que está la sábana en la que nuestro Señor fue envuelto en el Sepulcro y afirman que en ella están señaladas dos figuras, una boca arriba y otra boca abajo. También añaden que está en otros cabos (sic), pero lo cierto no se sabe. "*³⁶

(Another day we went to eat at Chamberí, which is a league and a half away. This city is the main place in the province of Savoy. The Lordship of the Duke extends twenty leagues to the city of Lyon. Here it is said to be the sheet in which our Lord was wrapped in the tomb, and they claim that there are marked two figures, one facing up and one face down. It is also said that it is in other places, but the truth is not known.")

³² BARTA. C. *Hipótesis para el Vacío Histórico de Constantinopla a Lirey*. Linteum-nº-36 (2004) p.25-33

³³ Zaccone G. M. Le manuscrit 826 de la Bibliothèque municipale de Besançon. Actas del III Simposium del CIELT. Niza. 1997. p211-217

³⁴ BARTA. C. *La Síndone en Chambery durante el S. XVI*. Linteum-nº-31 (2001) p.14-16

³⁵ García Martín, Pedro. *La Cruzada Pacífica*. Ed Serval. Barcelona 1997

³⁶ Personal communication provided by D. Pedro García Martín

One explanation for saying “it is in other places” is that the Besançon shroud (which is about 300 km from Chambéry) had gained some popularity. The first written news on this subject dates from 1523, but there are indications that the first exhibition began around the year 1515³⁷. An altarpiece of 1516 seems to indicate so³⁸. These first reports of the shroud with an image at Besançon, were from the early sixteenth century, just when the first copies of the Shroud in Chambéry were made. Some examples are that of Lisbon Xabregas (~1509) and those of Noalejo (1527) in Jaen (Spain).

But the popularity obtained after more than a century demanded that the Besançon copy were more than just a painting and Dunod de Charnage and the ecclesiastical authorities started the searching of a reputable origin. As the authors mentioned, it was Jules Chifflet³⁹ who about 1656 initiated such a search. In this case, the Chifflet searching was nearly a century and a half after the first mention. Dunod references cartularies and manuscripts⁴⁰ to rebuild the transfer from Othon to Amédée, and he says that the shroud passed through the hands of Othon's father Pons in 1206. From reliable sources⁴¹, it is known that the father had died in 1203 even before the sack of the Byzantine city. If the shroud that came from Constantinople had been deposited in the cathedral of Besançon we would have another difficulty against the hypothesis of it being the same as that of the sixteenth century: the burning of the cathedral in 1349, in which the shroud either would have been reduced to ashes or would have already disappeared without leaving any trace in any inventory.

Dunod de Charnage and the ecclesiastics of Besançon cited, among their sources, a manuscript of El Escorial in which Jerome Turruta, an Aragonese gentleman, relates how the crusader princes awarded Othon with "the most beautiful of the relics staying in Constantinople"⁴². Unfortunately we failed to locate the manuscript of El Escorial that could exist in 1656⁴³ -⁴⁴.

The overwhelming majority of crusaders who seized a relic in the East sent it to his country to be given to the local church. If Othon had the Shroud, probably he would have done the same. The letter of 1205 is the last news in the East. The sending to his father Pons is unsustainable as we saw, because he had passed away, but, by contrast, it is quite natural the transmission to his eldest son, Othonin, the only one of his offspring who remained in France. The son resided in the castle of Ray sur Saone where even today their descendants retain a wooden box which is reputed to have been used to move the Shroud to France by Ponce de Lyon⁴⁵. The current owner of the castle and of the chest, Diane de Salverte, is a blood descendent of Othon de la Roche. This chest would enclose the Shroud of Turin folded in 96 folds. The genealogy is the argument for getting it to Lirey. Othonin

³⁷ Gail, Paul. *Histoire Religieuse de Linceul du Christ*. France-Empire. Paris. 1974. 195

³⁸ Coindre Gaston. *Mon Vieux Besançon*. 1960 (1^a edición 1900) p420.

³⁹ Jules Chifflet, who is the source for Dunod and for the clergyman, was chaplain of Philip IV in Spain between 1656 and 1659.

⁴⁰ Dunod de Charnage (1750) referred Jules Chifflet manuscripts (1610-1676) and cartularies of the abbeys of Acey and the Charité and a handwritten genealogy of Pierre de Luxembourg, Count of Conversano.

⁴¹ Girard Jean. *La Roche et l'Épopée Contoise de Grèce*. L'Atelier du grand Tétrás. Besançon (1998) p26

⁴² Zaccone G. M. *Le manuscrit 826 de la Bibliothèque municipale de Besançon*. Actas del III Simposium del CIELT. Niza. 1997. p211-217

⁴³ The author's manuscript would not Jerónimo Turruta but Jerónimo Zurita whose library was then deposited in El Escorial.

⁴⁴ BARTA, C, DIELT, N, ORENGA, J.M. *El Manuscrito de El Escorial y Othon de la Roche*. La Ciudad de Dios. CCXXII (2009) p.783-813

⁴⁵ de Salverte, Hubert. *Petit Guide pour les Visiteurs du Château et du Parc de Ray*. Ray 1980. p3

(Othon II) had three children. Isabel, the youngest, would marry Hughes de Vergy⁴⁶ the father of the grandfather of Jeanne de Vergy, the first undisputed possessor of the Shroud.

It IS NOT a single piece.

Currently the centre of the shroud is marked by a fold or crease that runs along its length. This was the centre when the fire of 1532 occurred and when the 4 groups of burns in L were marked. But during the restoration work of 2002, Dr. Flury Lemberg, who led this restoration, noted another fold next to the one previously mentioned, but that does not match the current centre and it is shifted toward the side opposite to the side wound. She explains her discovery in her book *Sindone 2002*⁴⁷:

Only a few centimetres away on the left from the centre fold line a second, much more delicate, firmly impressed V-shaped groove can be distinguished which also runs along the whole length of the cloth. I would like to call this the "primeval fold" as it belongs to the very first folding after the Shroud had been finished. ... Those folds are due to the production process of the fabric, they are not the result of using the fabric.

This fold also runs along the entire length of the fabric. In the opinion of this expert, this fold appeared just after the end of weaving when the Shroud was folded the first time⁴⁸. It is the first fold after removing it from the loom preparing it for distribution⁴⁹ (see Figure 13 and Figure 14).

Let's get to the ultimate consequences of the existence of this primitive fold⁵⁰.

This fold indicates where the half of the cloth was when its weaving was finished. We have only to assume that it was folded in half, as expected. And if we know where the half was, we know what the original width of the Shroud was just after it was woven. It is sufficient to observe the presence of a selvage at the edge of this side of the fabric. What is the selvage? The selvage is the edge of the fabric when it is woven on the loom and where the thread of the weft turns. If the thread continues on the edge, that was the edge on the loom. On this side there are no seams or joints.

Then, the distance between the primitive fold and the selvage corresponds to one half of the original width of the fabric: 58.6 cm. And if this was the half of the shroud at the end of weaving, the total width would be double: 117.2 cm more or less. But in that case, the Shroud was 6.2 cm wider when leaving the loom than currently⁵¹.

However, the other edge has also selvage and it was an edge in the loom. We wonder how the edge could be further than it is now. The answer is simple: along the entire length there is a seam. If today there is a seam, at some moment the sideband was separated and the edge was at its correct distance and all that has happened is that the missing part has been

⁴⁶ P. Anselme. *Histoire généalogique des maisons de France*. Paris. 1726. Cited by Bergeret o.c.

⁴⁷ Flury-Lemberg, Mechthild [2003] *Sindone 2002*. L'intervento conservativo, *Preservation Konservierung*. Ed ODFP. Torino 2003. page 43.

⁴⁸ I thank to Socorro Mantilla, a Spanish disciple of Mme Flury, for rereading this chapter. In particular, she rules out any possible questioning of this type of observation of their teacher.

⁴⁹ Flury-Lemberg, Mechthild [2001]. *Traces, sur le Linceul de Turin, d'une histoire très mouvementée*. Original in German. Translation by Pierre de Riedmatten. *Montre Nous Ton Visage (MNTV) n°32* pages 32-49

⁵⁰ BARTA C. *Le Pli Primitif*. *Revue Internationale du Linceul de Turin*. N.33/34. p4-10

⁵¹ We can not provide the measurement with a uncertainty lower than ± 0.5 cm.

removed, it was an intermediate band. So, we know the original width of the Shroud when it left the loom⁵².

This follows from the discovery of the primitive fold by Dr. Flury Lemberg and from assuming that it was folded in half. But just 15 days ago, when I was preparing this paper, I found another possible confirmation of this conclusion. It is the first time it is presented in public. It is another fold that also appears quite evident and runs the full length of the Shroud. It does not correspond with the known forms of folding the Shroud. This fold is in the middle of the original half with the size as it is proposed here, and confirms the original width of the shroud which is deducted from the primitive fold.

So, we can assume with a high degree of certainty that the original width of the shroud was slightly greater than at present. The reduction was performed on the left side that has the lateral band of approximately 8 cm. An intermediate missing part has been removed and the lateral band was stitched at some later time.

The sideband tissue is the same type of cloth as the central part. Several hypotheses have been proposed: for example, somebody thinks that the band was cut and stitched from the opposite end to the current side. This hypothesis can be clearly ruled out because the opposite end has a selvage. This implies that it was already an edge at the loom. Others propose that it was cut from the same side and sown back for some unknown reason. On these assumptions I refer to the article by Adler⁵³ which concludes as more probable that this band is not separated from the central part and the separation is only apparent because it is only an overlapping seam. However, the samples delivered to the Belgian textile expert Gilbert Raes included two separate pieces which definitely confirms that there is no continuity between the sideband and the central part and, therefore, the Shroud IS NOT a single piece.

Why does the Shroud have this seam? One can think of two types of hypotheses: a repair of a cut or accidental tear, or rather an intentional⁵⁴ intervention. Here we propose the last.

If the original width of the shroud was slightly larger than at present, the simplest hypothesis is to assume that it was used with this width to wrap the body. In that case, the image was formed on the cloth with its original width. And the image was not centred in the width.

However, the intervention consisted of cutting an intermediate band, remove it and to sew the side band to the central part (Figure 15, Figure 16, Figure 17 and Figure 18). The intervention was undoubtedly made very carefully by specialists because they preserved the edge, ensuring the conservation of the Shroud. Since then, the Shroud already has the

⁵² Nothing precludes the Shroud had already a stitching when it came out of the loom, as Mme Lemberg believes. She told me this opinion during the third Convention of the Centro Español de Sindonología (CES) in May 2009. But in that case, it would not be the same seam that we can observe today. Even if the Shroud came out of the loom with a seam, the Shroud would be wider than at present to allow in explanation for the primitive fold. At least somebody modified the original seam to shorten the original width. We can then wonder why the Shroud was made with a seam before leaving the workshop. In any case, the existence of a previous sewing does not question the argument developed in these paragraphs.

⁵³ Adler. A, Whanger&Whanger. Concerning the Side Strip on the Shroud of Turin.

www.shroud.com/adler2.htm. 1997

⁵⁴ For example, the opinion of M. Saillard in the Revue Internationale du Linceul de Turin. N.33/34. p11-16. Others have related it to an event of Epiphanius of Salamis that might have been involved with the Shroud. This bishop tore a sheet with an image that was on Anablatha church (see <http://www.ccel.org/ccel/schaff/npnf206.v.LI.html>)

current width. And now the image is centred. Before, the image was not centred; now, it is. Again, the simplest hypothesis is that the intervention was intended to centre the image⁵⁵.

If, originally, the image was not centred ... the image can not be the work of an artist. It is unlikely that a hypothetical artist, who has been so talented as to create the image of the Shroud that still challenges the experts, would have made a mistake of a beginner not placing the image centred on the canvas. The image most probably corresponds to a fortuitous origin resulting from its use as a burial cloth. The placement of the deceased in the shroud allows placing the body only approximately in the middle, and an error of a few centimetres is understandable. It would then be the body itself which would produce the image.

What can we say about the time when the seam was added? If the seam is made to centre the image, it must be made after the formation of the image of the buried person. On the other hand, we can limit the time of execution by the late twelfth century based on the existence of the four burns in "L" represented in the codex Pray because they assure us that on those days the Shroud had the actual dimensions⁵⁶.

A further consequence of the existence of the primitive fold is that if the seam was made after the image formation, the threads used for the seam were not present in the image formation. The dating of the sewing threads would rule out or confirm some assumptions that were made to explain the unexpected result of Carbon 14⁵⁷.

Furthermore, several hypotheses have been proposed in relation to the missing corners as well as its length^{58 59}. Some authors think that the corners or a piece of the end of the feet were cut by Baldwin II Latin Emperor of Constantinople to send them to S. Louis King of France in 1238. We have seen that the relic received by S. Luis does not belong to the Shroud of Turin. The Shroud has not been shortened since there were the four sets of burns known as the poker holes and this incident happened before 1195 (Pray Codex) at a time when it was folded once over the length and other over its width. In conclusion, the Shroud of Turin has had the same size for many centuries and the only apparent unexplained cuts are the ends of the sideband⁶⁰.

The existence of the primitive fold has informed us of the original width of the Shroud of Turin in 117.2 cm and it requires that the image was not centred, which rules out its performance by an artist. This simple argument, which can be followed by any person without special training, is added to all other arguments and assures us that the image of the Shroud is not a painting.

It IS NOT a lepton of Pilate

The issue of coins on the eyes stands more than two decades ranging from exaggerated optimism of the defenders of the authenticity of the Shroud to the absolute rejection of

⁵⁵ This idea has already been proposed by Professor Federico Lopez-Amo. Estudio Técnico-Textil de dos Piezas Singulares de la Arqueología Paleo-Cristiana: La Síndone de Torino y el Sudario de Oviedo [Parte 1ª] Boletín Intexter (U.P.C.) 1999. n. 116 p68

⁵⁶ Barta, César 2002. Taille et intégrité du Linceul. RILT n.22 pages 2-6

⁵⁷ BARTA C. Le Pli Primitif. Revue Internationale du Linceul de Turin. N.33/34. p4-10

⁵⁸ Petrosillo O. y Marinelli E. El Escándalo de una Medida. Marcombo. 1991. p181

⁵⁹ Grazia Siliato, Maria. La Sábana Santa. Una impronta de hace dos mil años. PPC. Madrid 1998

⁶⁰ There is no certainty about the time when the ends of the sideband were cut. We can suspect of Margaret of Austria. Barta, César 2002. *Taille et intégrité du Linceul*. RILT n.22 pages 2-6.

much of the detractors of that authenticity who deny entirely the evidence supporting the hypothesis of the coins on the eyes. There is no general consensus.

We believe that the presence of objects on both eyelids is substantiated enough, and perhaps also above the left eyebrow of the "Man of the Shroud". These objects could be coins but their identification is not confirmed. F. Filas proposed the object was a lepton of Pilate. But there are many samples of the lepton of Pilate that do not correspond to the latest high-resolution photos of the right eye (Figure 19)⁶¹.

We have seen in a previous section that the current requirements for preparing the corpse of a Jew require placing shards or pebbles in eyes and mouth. There is evidence that coins were used in Jewish burials in Judea at the time of Jesus Christ but their rarity suggests that it was not a widespread custom. About the position of these coins or shards we can only say it was done somewhere in the head but can not say whether it was in the mouth or eyes. If there aren't many archaeological confirmations this may be due to the particular conditions of the findings because the coins could be lost or withdrawn during the transfer from the first to the second burial⁶².

It IS NOT a ponytail.

Several researchers pointed out the presence of the matted hair tied up in a ponytail on the Man of the Shroud. It is easy to see the back of the hair on the Shroud image. If we look carefully and use the reinforced negative image, we can clearly see long hair falling from the bottom of the nape of the neck to the space between the shoulder blades (Figure 20). The hair looks very much like a ponytail and yet we cannot see anything that is holding it in such a position.

The hairstyle has often been attributed to a typically Jewish style in the time of Christ⁶³. However, it would seem unlikely that the subject's hair would remain in place after the tortures suffered. Furthermore, there is no evidence of anything holding the ponytail in position. How could it have remained thus? We believe there is a simpler and more probable solution that comes from the use of the Sudarium of Oviedo on the Man of the Shroud's head; the so-called "ponytail" is the result of the Sudarium being placed and sewn around the hair on the back of the head to hold it in place.

In fact, there is a stain in the lower left corner of the obverse of the Sudarium that looks like the silhouette of a butterfly. It is just about 10 cm below the stain dots on the nape of the neck and can be reproduced in the laboratory when bloodstained cotton is wrapped in a linen piece and pressure is applied to it. The cotton is like a lock of compressed hair and the butterfly stain corresponds also in the Sudarium to the ponytail⁶⁴.

The most likely sequence of use begins by placing the edge of the cloth on the right of the nape of the neck with the lower corner slightly below the cervical vertebrae, thus covering

⁶¹ ORENGA J.M. y BARTA. C. *La Hipótesis de las Monedas sobre los Ojos del Hombre de la Síndone*. Linteum-nº-41 (2011) p.8-14

⁶² According to custom, the body was buried first (primary burial), and over time, when the soft parts of the body disappeared, the remains were buried (secondary burial) in another tomb or an ark (ossuary).

⁶³ Wilson, I. Schwortz, B. *The Turin Shroud*. p42 and Stevenson K. y Habermas G. *Dictamen sobre la Sábana*

Santa de Cristo. 3ª Edición Planeta (1988) p.49

⁶⁴ For a first description of the Sudario de Oviedo see Rodríguez Almenar, Jorge M. *El Sudario de Oviedo*. Pamplona (2000) Eunsa y Guscín, Mark. *The Oviedo Cloth*. Cambridge. Lutterworth Press 1998. For a detailed study of its use see Villalaín J.D. *Naturaleza y Formación de las Manchas*. Proceedings of I Congreso Internacional del Sudario de Oviedo. Oviedo, Octubre-Noviembre de 1994. p 131-176

the back of the neck and the top of the head. The rest of the Sudarium covered the left ear, the nose and mouth and reached the right cheek. It was then folded back again on the nose and mouth. The right ear was left uncovered in the first phase. In order to hold the cloth in this position it was sewn with linen thread (some is still left) to the hair on the back of the head. This can be deduced by sets of two holes relatively parallel to the bloodstains of the butterfly stain. There was a matted lock of hair between the linen and the stitches for approximately two hours. The recreation can be seen in Figure 21. Dirty hair impregnated with blood and sweat held in this position for two hours would leave it firmly in place. I have carried out various experiments of the process of what happened to Jesus' hair during the Passion. Volunteers' hair was covered with serum, dust and blood and it was seen that it became firm when the blood originally from the thorns dried (Figure 22).

We conclude that the hair was pulled back and sewn to the Sudarium on the back of the head. When the Sudarium was removed the ponytail shape would remain because of the dried blood, and the hair was not washed. When the dead body was placed inside the Shroud, the ponytail was recorded by the image formation process. The lock of hair defined by the use of the Sudarium could therefore be the Shroud's ponytail.

This explanation was unexpectedly confirmed while overlaying the stains on the nape of the neck on the two cloths. We had to turn the Sudarium 19°, and in this position the stained corner of the Sudarium lies just over an angle in the ponytail on the Shroud. As can be seen in Figure 23 the hair falls down from the left of the head towards the centre of the back and just where the edge of the Sudarium would be, the ponytail moves sideways to fall vertically. The Oviedo cloth would have held the hair above the angle and from that point the hair was free to fall straight. This also explains the shape of the ponytail on the Shroud.

It IS NOT a cloth dated correctly.

The Shroud of Turin was dated by the Carbon14 method in 1988. Three laboratories were involved and three other control samples were simultaneously analyzed⁶⁵. Such a profusion of measures allows a statistical analysis to evaluate the consistency of results. In fact, the Nature article for the dating of the Shroud include the Chi square (χ^2) and its associated significance level as a statistical validity test for the Shroud sample and for the other three control samples. The test is performed to quantify possible inconsistencies when there are more measures than one of a single sample.

According to criteria commonly used in statistics, the sample used to date the Shroud was too heterogeneous and therefore the dating of the Shroud of Turin was inconsistent. This result is produced only for the Shroud while all the control samples passed the test successfully. For people against the method of C14 we have to note that this method gives good results for the most of the samples. But in the case of the Shroud the scientific rigor was relaxed, those responsible neglected the recommended practice in the field of statistics, and they concluded it to be fake. However, they should never give a definitive verdict with a significance level as low as it was found for the Shroud. We think that, in assessing the results, some scientists have underestimated the contribution of statistics.

The statistical analysis indicates that the sample of the Shroud is not homogeneous. That would mean that the flax of the very near threads has been grown in different ages differing in nearly a century.

⁶⁵ Damon et al. (1989) Radiocarbon Dating the Shroud of Turin. Nature Vol. 337 n° 6208 16 February 1989 p 610-615

An investigation of the causes of such heterogeneity led to surprises. Further analysis⁶⁶ shows a correlation between radiocarbon age and the geometric area where the sample came from: it's more modern as we move farther from the edge where it was cut.

In the years after the dating, various possible causes for this excessive variation in tissue composition have been proposed. Here we just mention them because they are not the object of this article. The heterogeneity would be logical if the remnant of Shroud analyzed came from a patch, an area of irregularly irradiated tissue or with a different degree of contamination or combustion. In the year 2005, a study was published⁶⁷ which shows dramatic differences in the physicochemical characteristics of the fibres adjacent to the corner from where the samples were taken for the dating with respect to fibres from the central body. At this moment, none of the proposals have reached a broad consensus. The issue remains open.

In short, the heterogeneity of the sample of the Shroud is a statistically proven fact. This result should at least have put in quarantine the dating of it and make us start to wonder why such heterogeneity is present. The more balanced conclusion would be that the dating is invalid until the fault is explained.

Statistics show that the method of carbon-14 dating gives brilliant results and it is a useful method in archaeology, but it is far from being infallible, and it is not a reason to invalidate an archaeological investigation where the outcome differs from other evidence⁶⁸.

It IS NOT a painting.

Among those who believe that the Shroud is the work of an artist, the most widespread hypothesis is that it is a painting. The paint hypothesis also claims to be supported by scientific observations and experiments, such as those of Walter Mc Crone. This microscopy expert said that the image of the Shroud was a painting, whose pigment contained Iron Oxide for the image and Iron Oxide with Vermilion for the blood, and whose binder was collagen. The collagen would yellow with the pass of time, and now also contributes essentially to the image.

McCrone's claims surprised the Shroud of Turin Research Project (STURP) researchers who had been examining the Shroud directly, and for them it was clear that this could not be a painting. That was specifically a hypothesis to be tested with the series of tests that had been selected. The STURP used in 1978 in Turin:

- Spectrometry in the visible range
- Ultraviolet spectroscopy
- Infrared spectrometry (3-5 µm y 8-14 µm)
- Infrared reflectography
- X-ray Fluorescence Spectrometry
- Radiography
- Thermography

Later, the analysis for the samples used:

- Biochemical Analysis
- Raman Spectroscopy

⁶⁶ Walsh B. (2002) The 1988 Shroud of Turin Radiocarbon Test Reconsidered. Part I
<http://members.aol.com/turin99/radiocarbon-a.htm> (2002)

⁶⁷ Rogers R. (2005) *Thermochemica Acta*. 425 189-194

⁶⁸ BARTA C. Datación del Sudario de Oviedo. *Actas del II Congreso del Sudario de Oviedo*. 2007.

Pyrolysis.

Paintings are analysed with these techniques, then and now. Many of these techniques were used in 2006 on the study of the "Gioconda" of Leonardo da Vinci⁶⁹. The immediate conclusion that the researchers obtained "in situ" is that it was not a painting. But the McCrone studies caused doubts for a moment to the STURP team, about their conclusion being too hasty. However, all subsequent specific analysis led to the conclusion that the presence of iron could not be in the chemical form of oxide because; if it were hematite, it should be an image tremendously intense. Simulations with iron pigment by artists like Sanford demonstrate this feature. The macro-photographs of these reproductions clearly show the presence of pigment lumps marking a net difference with the equivalent macro-photographs of the image of the Shroud (Figure 24, Figure 25 and Figure 26)⁷⁰. The most plausible reason to explain the presence of iron that McCrone had detected by dispersive energy was that the iron came from the blood in the cloth: it had been spread beyond their own areas of blood to the other parts of the cloth when it was folded and rolled. In addition, the iron would come from the washing experienced by the linen in its manufacture. Some traces of iron oxide were effectively observed, but it came from the burning of blood.

The findings of greater consensus within the STURP were:

- The image on the Shroud is not a painting.
- The image is not "additive", ie no material is added to the cloth in the image.
- No pigment or binder or other natural fluid different from blood has been added to the cloth after manufacturing.
- The nature of the image is an alteration (oxidation/dehydration) of the flax itself which comes from conjugated double bonds between carbon atoms⁷¹ of the ring of the cellulose $-C=C-C=C-C=C-$

Therefore, any hypothesis of paint, which is the thing most frequently suggested among the artificial ones, is sufficiently analyzed from a scientific point of view and its exclusion is firmly supported. In our opinion, if the Shroud of Turin were a painting, no doubt would have remained after the 1978 research.

To rule out definitively the painting hypothesis, we can compare the real Shroud with attempts by artists to reproduce the image of this cloth, in antiquity (from about 1509) just a century and a half after its first showing in Occident, to the present. They exist today and are available for study. These are copies of the Shroud of Turin, and could be described as "shrouds" in fact created by man's hand. The copies show us what the technologies and cultures available in those days were able to come up with when people took up the challenge of creating a Shroud. They only made paintings. Rather than being mere speculations about which techniques our ancestors might have used to make a "Shroud", these copies are true examples of what they really did achieve when they tried in those days. There are roughly one hundred examples, many of which even exhibit printed text certifying that it is a copy of the original owned by the House of Savoy at that time. We can share our experience in the analysis of some of them. None of the artists considered scorching or rubbing a cloth over a bas-relief. In none of them did the artist attempt to do anything other than paint the figure he was seeing. It has been copied by various artists with varying degrees of skill. In these cases the authors were exempt from "inventing" the

⁶⁹ «Inside the painting». Ed. Harry N. Abrams.

⁷⁰ Alonso, Marcel. Travaux Scientifiques Récents Effectués sur le Linceul de Turin. Cahiers sur le Linceul de Turin. 2006 n° 35. p26

⁷¹ Rogers o.c. pag. 86

negativity; they rather had to imitate it. Even so, the vast majority seemed betrayed by their subconscious and they misrepresented some features as positive in order to better interpret what they were doing.

Another feature that differentiates the Shroud of Turin from its copies is the absence of edges. The original image has no defined edges, that is, the image fades gradually as it passes from the image area to the imageless area. But on the copies it is even usual to see a line that borders the figure to facilitate its implementation. It is a common practice for the artist to mark an area with a smooth line around it to help shape the painting and then fill the area with colour.

Another feature easy to verify, that makes the copies different from the original, is that the image on the copies passes through the fabric and it can be seen on the reverse side. In fact, any liquid-based paint is absorbed by capillary action of the threads and soaks through to the reverse of the fabric. We verified this feature as well in the copies in our study. The copies that best simulate the original image have either been produced on the fabric without the typical preparatory sizing or this has been very subtle to better mimic the original. The paint used by the artist soaked considerably and the image is seen on both sides with almost the same clarity. This characteristic of the image of the Shroud also differs from the paintings that attempt to reproduce it. For centuries, the reverse of the Shroud had been hidden by the fabric reinforcement or Holland cloth placed by the poor nuns of Saint Clare after the 1532 fire. But during the restoration of 2002, the reinforcing fabric was temporarily withdrawn and the hidden side of the cloth was extensively photographed. The findings were that there is no actual image on the reverse side or hidden side and that only the blood that permeates the Shroud has transferred across.

But the most definite and simple feature that makes the original different from the painted copies is its photograph by transmitted light, that is, by transparency. In 1978, during the days of observation, the STURP people made pictures of the Holy Shroud by transparency. The silhouette of the blood stains could clearly be seen as the substance added to the cloth blocks the passage of light and makes a dark shadow. However, there was no silhouette for the image because it is not formed by any substance added to the cloth. The image disappears with lighting by transparency on the Shroud. In contrast, the picture painted in the copies makes a shadow, as expected, and its silhouette is easily seen (Figure 27).

We would like to point out that the Shroud of Turin is not a photographic negative in the technological sense because of the transparency. In a classical photographic technique, the negative is specifically used from transmitted light illumination. If the Shroud of Turin were used for this purpose it would not give the positive image.

The negativity, the lack of edges, the absence of image on the hidden side and the transparency of the Shroud image differ considerably from their copies. The copies are paintings and the Shroud does not have their characteristics: it can not be a painting.

The Shroud IS a mystery.

As mentioned at the beginning, if the Shroud did not have the image it has, the Shroud would be accepted just as the shroud of a crucified. But the Shroud, despite being the most studied artefact in the History of Archaeology, still refuses to reveal the mystery of its image.

The image of the Shroud is perceptible by the slight darkening of the outer part of the fibres forming the linen threads. It is only visible by reflected light because it is due to a

lack of brightness of some flax fibres whose properties are modified on their outermost surface.

There is no consensus about the image formation mechanism. All attempts at imitation have failed or had very limited success. But at least we can say with certainty that it is not the result of a painting, nor tracing, nor dithering, etc. It is neither a photograph nor its result. The overwhelming majority of in situ analysis and those conducted in the laboratory have ruled out these possibilities and have been published in scientific journals. All imitation attempts failed and in all of them we can detect the effects of the artist's hand. All kinds of mechanisms for its formation have been proposed: vapour emission, proton emission, and ultraviolet radiation, but there is always some feature in the Shroud that does not correspond with the proposed mechanism. Today the image of the Shroud IS and remains a mystery.