

# Dale's interview <https://www.youtube.com/watch?v=2YHkaqLawTw>

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## 1. Intro question- how are you Giulio, what are some of the newest updates in terms of your studies on the Shroud that you are working on right now?

Fine thanks. Yes, actually I have to apologize if I was only now able to answer the various questions and doubts that have been raised in the previous interviews because I am working in parallel on several jobs that I consider very interesting and fascinating.

Among them, I have just delivered the drafts of a new book titled "*The Holy Fire and the Divine Photography: the Image of the Holy Shroud of Christ*". In this book I formulate a new hypothesis of formation of the Holy Shroud body image based on the interaction of the bodily fluids emitted by the corpse of Jesus Christ wrapped in the Holy Shroud and mixed with an amalgam of aloe and myrrh, with the electric energy supplied by the discharges produced by lightning very similar to those we can admire every Holy Saturday of the Orthodox Easter inside the Edicule of the Holy Sepulcher in Jerusalem.

I am also studying the blood traces left on the flax fibers taken from the Holy Shroud to deepen the results that I have already published in two recent scientific papers PHOTO #1.

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Original article  
**Blood reinforced by pigments in the reddish stains of the Turin Shroud**  
Giulio Fanti<sup>a,\*</sup>, Giuseppe Zappalà<sup>b</sup>

Keywords:  
1. Introduction  
2. Research aim  
3. Materials and methods  
4. Spectral analysis of reddish particles  
5. Results  
6. Conclusions  
7. Conclusions  
Acknowledgements  
Appendix A. Supplementary data  
References  
Show full outline

Cited By (6)  
Figures (9)

Highlights

- Human blood has been found on the red stains of the Turin Shroud.
- Also red pigments have been found on the red stains of the Turin Shroud.
- Conflicting hypotheses about the origin of this material have been formulated.
- New analyses on this material furnish a hypothesis that explains the conflicting hypotheses.
- The initial blood on the Turin Shroud was later reinforced by pigments.

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World Scientific News  
2022 | 181 | 99-114  
**A Reexamination of the Pigment-Reinforcement Hypothesis of the Turin Shroud's Bloodstains**  
Giulio Fanti  
Full texts: Download  
Languages of publication: EN  
Abstracts:  
EN New studies based on X-Ray photographs of the Turin Shroud (TS) from 1978 and new quantitative tests induced the author to reexamine the viability of a hypothesis he had discussed in a prior work [1] where he stated that "A possible explanation for the presence of blood and pigments in the samples studied is that the bloodstains were originally produced by human blood which faded with time... [and] have been reinforced by artists in the past centuries." In fact, the new quantitative results exclude ochre/iron oxide and vermilion/minerale/organic oxides as being responsible for the redness of the stains of blood that are visible with the naked eye on the TS. Having ascertained this result, two problems now arise. First, the origin of the additional reddish material found in correspondence with the TS bloodstains needs an explanation. A hypothesis to be confirmed is that the over 50 documented/paired copies of the Pklic made in past centuries may have deposited some pigment when they were pressed onto the TS, to be sacrificed into higher order relics. The second problem concerns the explanation of the continued redness of the TS bloodstains. In addition to the hypothesis regarding the effects of ultraviolet rays on the high biliverdin content in the bloodstains on the TS and of the presence of carbohemoglobin, the author considers the redness of blood coming from an alleged Eucharistic miracle.  
Keywords:  
en Bloodstains, Cinabar, Human blood, Red ochre, Shroud tapes, Sub-micro particles, Turin Shroud, X-Ray

PHOTO #1

In fact, after having clarified that traces of iron oxide and mercury sulphate are present in some bloodstains, but are not responsible for the reddish coloration of the blood traces, I am trying to better characterize the particular red substance of clearly organic origin compatible with the blood.

In fact, it seems that countless erythrocytes (commonly called red blood cells) are present, scattered along all the fibers, both in small clusters and arranged individually.

The characteristic under investigation is their micrometric size, much smaller than that of common human erythrocytes (of about seven micrometers) which could indicate two interesting factors:

- 1) the confirmation that Jesus of the Holy Shroud was highly dehydrated (as actually reported in the Gospels);
- 2) that the corpse was wrapped in a mixture of anti-putrid substances including aloe (as effectively confirmed in the Gospels), the presence of which, from experimental tests, appears to be even capable of halving the average size of human erythrocytes.

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2. Would you be able to outline and explain your statistical approach to linking the Shroud Man with the 692-695 A.D. solidus coins and what results you got from your study?

First of all I must comment that the interview pertained to the following questions seems to me to refer to an initial edition of the probabilistic approach published in the book "*The Shroud of Turin - First Century After Christ*", later widely improved in the new specialized book, by numismatic point of view, entitled "*Byzantine Coins Influenced by the Shroud of Christ*" which, however, has not been mentioned in the interview and which, in my opinion, should instead be considered its new details see PHOTO #2.

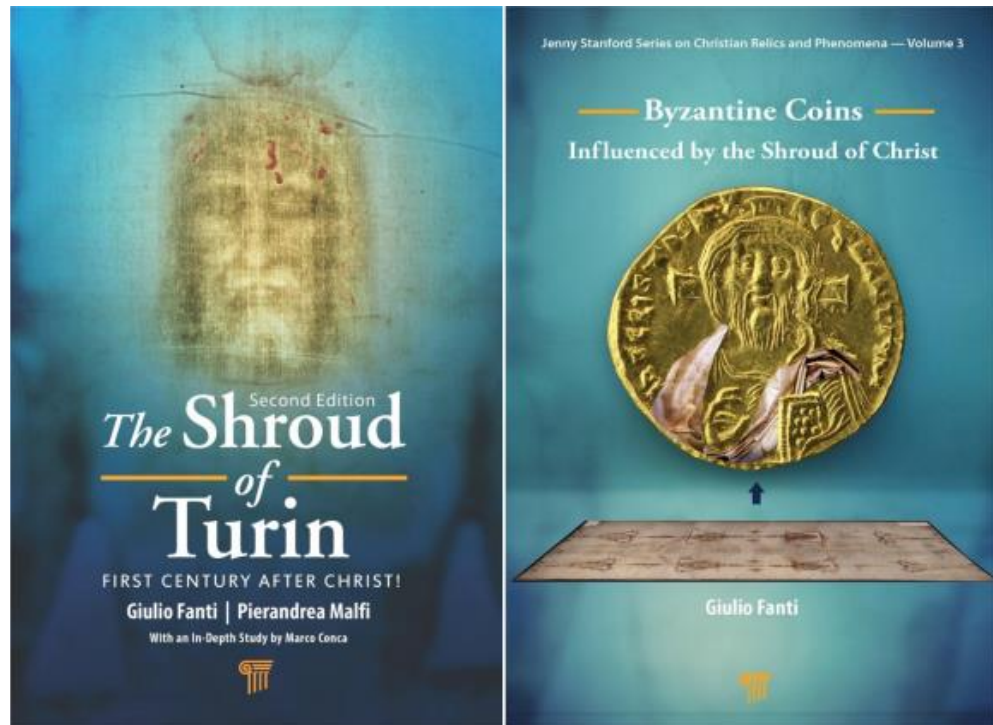


PHOTO #2

Consequently, I will comment on the initial statistical approach published in the first book and then I will mention the developments made to this model in the more specialized second book.

The idea of developing a probabilistic model arose from the fact that I wanted to somehow quantify numerically the overwhelming evidence regarding the fact that the face of Jesus Christ was taken as a model in Byzantine coinage starting from 692 AD.

This was done just when in the same year the Council of Nicaea approved, after more than six centuries, the possibility of reproducing the face of Christ in art, replacing other symbols such as the lamb or the fish. This therefore implies that the age of the most important Relic of Christianity is significantly earlier than the Middle Ages, as someone still persists in claiming without any acceptable support.

At the beginning of my project, the task was not easy, given that two coins engraved by hand by the same Byzantine engraver are very rarely found. We must also know that, in the absence of magnifying glasses, each engraver chose to reproduce only a few typical details of the face that he wanted to reproduce in dimensions of a few millimeters (tenths of an inch), necessarily leaving out others.

Among the various reproductions of the face of Christ first minted by Justinian II in 692 AD (and I have observed several dozen of them), I chose one that was well preserved to better highlight its details.

On this coin depicting the face of Christ (with the inscription "*Jesus Christ King of the rulers*" shown on the edge) I have defined a dozen somatic features typical of Jesus of the Holy Shroud and I have tried to quantify the possibility that the Byzantine engraver, who minted that coin, had to obtain that result, without having had the opportunity to see the face of Jesus of the Holy Shroud.

It seemed to me that the best approach was the probabilistic one, well defined by inferential statistics, which consists of the set of statistical techniques that allow us to generalize the results obtained from the data collected on one sample, to the population from which it was extracted.

Consequently, for each of the 12 somatic features highlighted, I subjectively assigned the corresponding probability that the Byzantine engraver had of obtaining that result, regardless of the observation of the image in question, that of the Holy Shroud.

For example, the image of the face of Christ on the Holy Shroud shows swollen cheekbones, the right more evident than the left, due to the numerous beatings suffered, and the coin under examination shows these characteristics very well.

From a probabilistic point of view, I therefore thought that the Byzantine engraver had only one probability out of 50 of deciding arbitrarily without any reference model to reproduce this very uncommon result.

Combining, with the probabilistic method, the various probabilities assigned for each of the 12 somatic features taken into consideration, for the principle of compound probabilities and on the basis of the use of the Bayes formula, applied to two mutually exclusive events (i.e. that the hypothesis into consideration whether true or false) it turned out that the Byzantine engraver executing the coin in question, had only 7.26 probabilities out of a billion billion of obtaining that face on the coin of Justinian II, without having first seen the image of Jesus of the Holy Shroud.

Obviously, someone can criticize the result by stating that this depends on the subjective choice of the probabilities assigned by me of the occurrence of a certain feature of the coin under

consideration. This is true, but for the moment I have not been able to apply a probabilistic method that is fully objective. However, in the new, more specialized book, I wanted to test the robustness of the previously obtained result by acting in the following way.

Considering the same coin of Justinian II, I first of all took into consideration a dozen somatic characteristics not all the same as those previously considered. Then I assigned a probabilistic uncertainty to the probabilities previously defined, by necessity in a subjective way, in order to include all the possible different subjective assignments, hypothetically made by other possible analysts. I then calculated the range of uncertainty to assign to the final result.

The new probabilistic model produced the following result: the Byzantine engraver had only 1 in 10 billion billion chance of getting that face on the Justinian II coin without having seen the image of Jesus on the Holy Shroud. However, the range of resulting values varies from 5 probabilities in a billion billion billion to 2 probabilities in 10 million billion.

Therefore, the previous statistical analysis, performed on different somatic features with different assigned probabilistic values, is included in the range of the uncertainty estimated by the new method, thus confirming the robustness of the probabilistic results obtained.

A better understanding of the meaning of this result, “1 chance over 10 billion billion” can be seen in the example referring a roulette game. It would correspond to the chance of hitting the same number, 12 consecutive times. Similarly, in the roll of a dice with six faces, it would correspond to the chance of having the same number, 24 consecutive times.

In support of the probabilistic result obtained, there are also more than 100 points of congruence determined by the scholars Alan and Mary Whanger on similar coins and the studies of the numismatist M. Moroni.

This confirms that the Byzantine engravers, who molded the face of Christ on the gold solidus of Justinian II, certainly saw the Holy Shroud or a good copy of it.

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**3. Are you familiar with [Justin Robinson](#), fellow of the Royal Numismatic Society and a member of the British Numismatic Society, who makes a similar argument based on the [bronze coins](#) and what is your take on his work?**

I do not personally know Justin Robinson who demonstrates that in 969 A.D., John the First Tzimiskes, Byzantine emperor from 969 to 976 put the face of Jesus very similar to that of the Holy Shroud on his bronze circulating follis coins. He also says that the comparability of these coins to the Shroud is even better than with the gold solidus coins that I use to make comparisons with the Shroud in the probabilistic model.

I must first note that this statement makes me think that Justin Robinson has not read my books on Byzantine coinage concerning the Holy Shroud, see PHOTO #2, and I then have various comments to make on this statement.

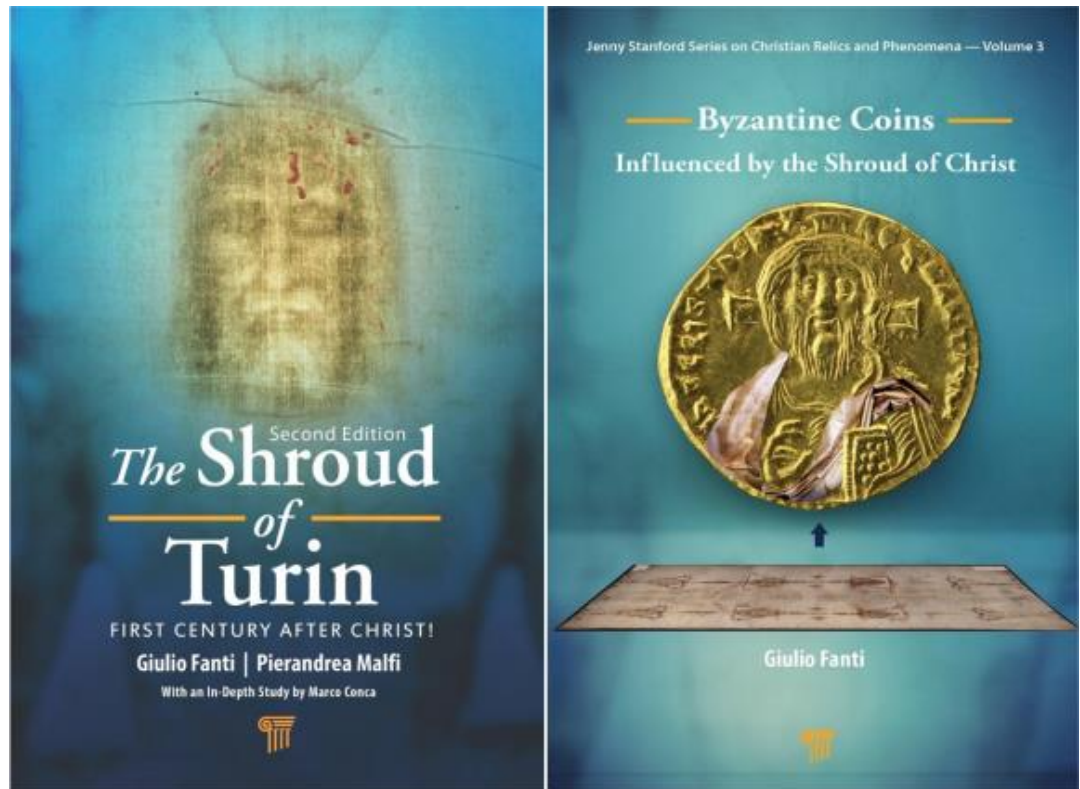


PHOTO #2

-1. I fully agree that the coin mentioned by Justin Robinson depicts a face of Christ copied from the Holy Shroud and I agree that this depiction is very faithful to the original, demonstrating that most likely the Byzantine engraver had the opportunity to directly observe the image body of the Holy Shroud.

-2. I must however observe that a single coin cannot be very representative of the whole coinage of a certain period under consideration, as for example indicated in PHOTO #3. Here we see that during the same period of Emperor John the First, other bronze folles were minted with faces that were also slightly different from each other, but always inspired by the Holy Shroud.

The face of Jesus of the Holy Shroud on the top left of the image can be compared with the image of Christ of the coin in question and with other seven bronze folles of the same emperor John the First.





PHOTO #3

For example, we see that all have asymmetrical long hair longer to the left in accordance with what we see on the Holy Shroud, but not all faces have a split beard. And this shows that not all Byzantine engravers bothered to reproduce all the particular details of Christ's face of the Holy Shroud, also due to the operational difficulties in reproducing such small images on coins.

It is true that I too take only one coin into consideration for the probabilistic calculation, but, as I have already explained, this was due to the difficulty of including all the innumerable coins of Christ minted during the Byzantine Empire into a probabilistic calculation. In the book, however, I have considered all these types of coins and I have commented on them one by one, arriving at showing how the general overview of this coinage demonstrates without a shadow of a doubt that the Holy Shroud was certainly used as a model to reproduce the face of Christ in Byzantine coins.

-3. As I observed in my second book, we must remember that gold coins were less frequent than bronze ones and their minting was always controlled and approved by the emperor. However, I don't think that this also happened for the bronze coins which were much more numerous. Just for this reason I preferred to give greater importance to the representations present on gold or silver coins rather than on the bronze ones.

4. The skeptic Hugh Farey showed us an image of about 22 solidus coins (same type as the one you used in your statistical analysis) and he said they have the following problematic features.

A) Show Jesus holding a book with his other hand making a weird sideways V-shape that does not correspond to the Shroud Man.

As an initial note I must say that certain skeptics, even if ignorant of the matter, pose as experts in order to denigrate at any cost the very interesting particularities of the Holy Shroud and the historical references linked to it.

Obviously, we need to teach these persons, that the book held in the left hand by Jesus Christ is the book of Gospels and that the right hand is raised in attitude of blessing, according to the Byzantine tradition and therefore must not have anything in reference at the Holy Shroud.

In fact, in Greek Orthodox iconography, as also in early Christian iconography, the gesture of the blessing hand actually shapes the letters IC XC, an abbreviation for the Greek words Jesus (IHCOYC) Christ (XPICTOC) which includes the first and last letter of each word, see PHOTO #4. The hand that blesses reproduces, with gestures, the Name of Jesus, the “Name above every name.”



PHOTO #4.

In addition to shaping letters, the gesture of blessing made by Christ also conveys doctrinal truths.

The three fingers below, used to spell the I and X also represent the Trinity, the Unity of One God in three Persons, Father, Son and Holy Spirit. The Bringing the thumb and the ring finger together to touch not only forms the letter C, but also symbolizes the Incarnation, the union of the divine and human natures in the person of Christ.

The reference to the most important Relic of Christianity in the Byzantine coin under discussion is therefore only aimed at the characteristics of the clearly tortured face.

**B) Many of the figures of Jesus have ears on them, so the coins you found without the ears like the Shroud Man are anomalies and unlike most of the other solidus coins.**

In my opinion, when one necessarily wants to attack something that is unassailable like the Holy Shroud, he is forced to nitpick, and therefore to make not-interesting statements.

As I pointed out in my last book on Byzantine coins, it was not possible for Byzantine engravers to reproduce all the particular features of Christ's face on the Holy Shroud within millimeters (tenths of an inch). Therefore, these engravers started from predefined models of human faces and gradually added some of the many details detectable on the Holy Shroud.

Here someone, but not all, as we have seen before, highlighted the characteristics of the split beard and someone else highlighted the lack of ears of Jesus of the Holy Shroud.

For example, in my new book I reported a rare coin (it's the only one I've seen in circulation) which depicts disheveled Jesus, see PHOTO #5.



PHOTO #5

In fact, according with Canon 82 of Trullan Council, the bloodstains could not be reproduced in images of Christ; hence the artists thought of reproducing the traces of blood as tufts of hair.

The coin of Justinian II in the photo therefore reproduces Christ disheveled precisely to show the shape and position of the wounds of Jesus detectable on the Holy Shroud.



C) Most coins show Jesus with different types of beards (some forked, some rounded, some wet, some pointed) and so there is no correlation between the coin's beards and the Shroud Man's beard.

Still the skeptics try in vain to appeal to some trivialities in order to show the listening public that they are right.

As I have just said, no Byzantine engraver was able to reproduce in a few millimeters (tenths of an inch) all the particular features of the face of Jesus of the Holy Shroud. So here someone dwelt on the split beard, others, like the one on the Justinian II coin on the cover of my latest book PHOTO #2, overlooked this detail by reporting a common beard.

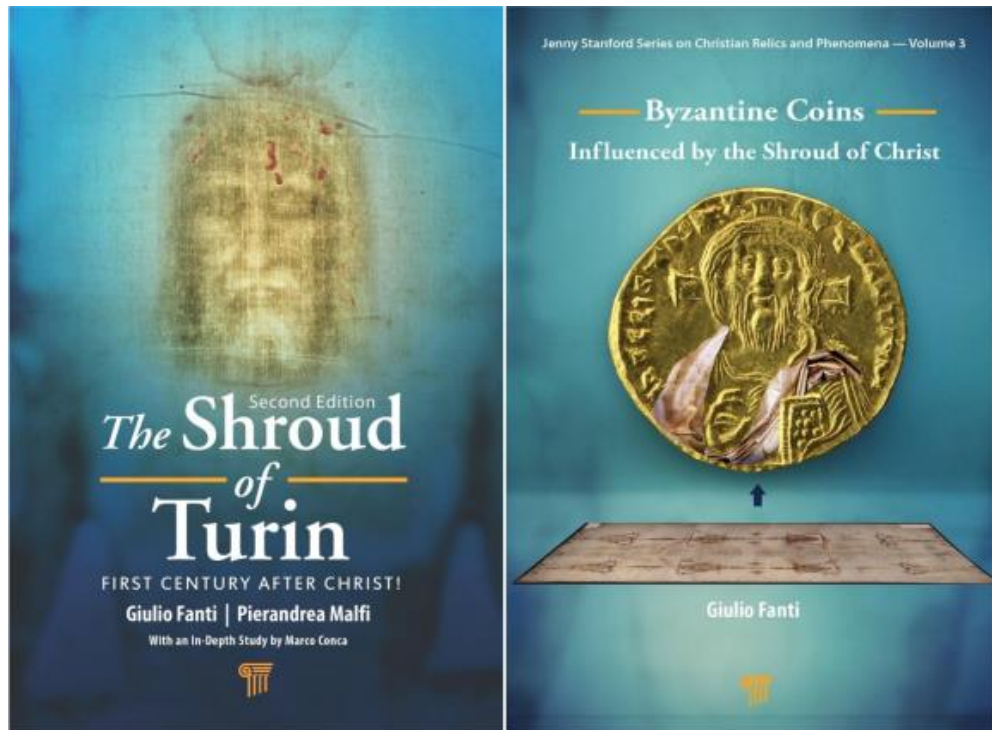
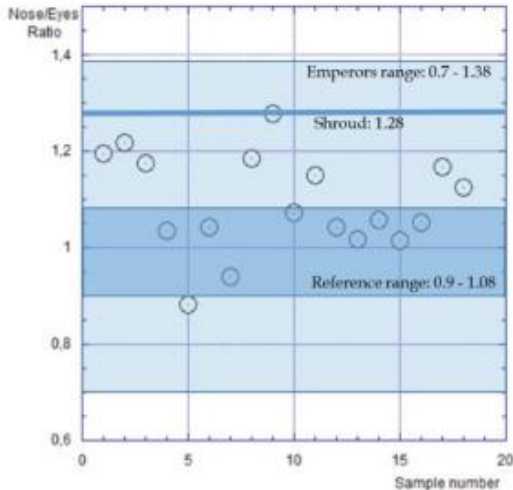


PHOTO #2

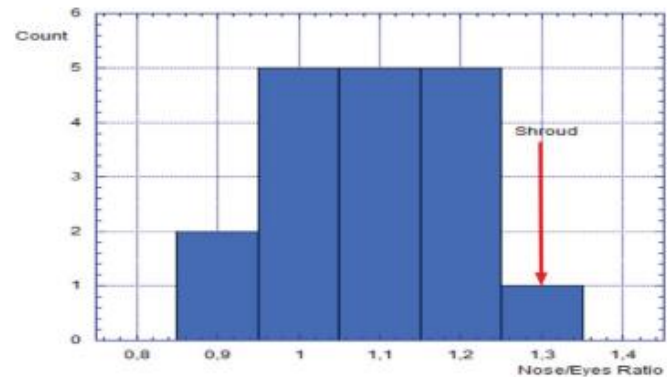
D) The proportions between the eyes and the nose on most of the coins varies considerably despite Giulio selecting one or two coins which just coincidentally have the same eye-nose proportions as the Shroud Man. Hugh says your findings are meaningless and explainable by random chance as most of the solidus coins don't have the same nose-eye proportions.

Here is another gratuitous and unjustified accusation, typical of skeptics without valid arguments. Unfortunately, this type of accusation is very effective against an audience that cannot be required to know many truths related to specialized aspects known only to some experts in the specific sector, and for this reason skeptics use these accusations to spread simply inconsistent claims to get the public on their side.

In Section 7.1 on page 236 of my book I develop in detail a quantitative analysis of the numismatic characteristics of the Byzantine coins depicting the face of Christ and on pages 238-239 I discuss, using two plots, see PHOTO #6, the results of the proportions between the eyes and the nose.



**Figure 7.4** Plot of  $R$ -ratios of 18 faces of Christ on gold and silver coins of Justinian II (692-692) reported in Table 7.2. For comparison, the  $R$ -ratio of the face of Christ on the Shroud is reported too.



**Figure 7.5** Histogram of the values of  $R$ -ratios relative to the 18 faces of Christ on gold and silver coins of Justinian II (692-692) reported in Table 7.2, and Fig. 7.4. For comparison, the  $R$ -ratio of the face of Christ on the Shroud is reported in the arrow.

## PHOTO #6

The ratios of the Justinian II gold solidi have to be compared with that of the Shroud which results in  $R = 1.28$ . A mean value of 1.09 resulted with a standard deviation of 0.10. Respectively, the maximum and minimum values are of 1.28 and 0.88. This shows that all the values are smaller or equal than that of the Shroud, but the mean value of 1.09 is quite high with respect to the reference mean values of 1.00 and 0.96.

In light of the Shroud, the following considerations may be extracted.

- 1. The relatively high variability of  $R$  can be explained by the fact that not all the engravers working in officinae (work places) distant from the place where the Shroud was displayed, had the possibility to look at the Relic in order to make a good copy of the face of Jesus Christ.
- 2. The influence of the face of the Shroud having  $R = 1.28$  on the engravers copying it increased the mean value to  $R = 1.09$  from the reference ones of 1.00 and 0.96.
- 3. Among the 18 faces of Christ taken into consideration, only one of them has an  $R$ -value equal to that of the Shroud, and two of them greater or equal to 1.20, probably corresponding to engravers who had the occasion to view the Relic or a good copy of it.
- 4. The gold solidus having a ratio  $R = 1.28$  equal to that of the Shroud is the rare coin showing various tufts of hair corresponding to the wounds visible on the Shroud in their specific location. So, it is easy to think that the engraver of this coin had the occasion to study the Relic directly and carefully.
- 5. The gold solidus having a high  $R$ -value of 1.28, shows other interesting details of the Shroud face like the lack of ears, thus indicating a probable direct observation of the Holy Shroud on the part of the engraver.

The histogram of the 18  $R$ -values relative to the measured faces of Christ on the coins of Justinian II on the right of the figure, showing roughly a Gaussian behavior, summarizes these considerations.

5. A) Both Bob Rucker and Hugh Farey expressed some skepticism regarding the basis for your statistical calculations showing the odds that the coins were based on the Shroud Man (at the 99.99% probability of correspondence). They are unsure how one would be able to demonstrate a proper statistical basis to provide an accurate objective probability as you claim to have done.

B) For example, at one point you mention you found there to only be a 7 out of a billion billion chance the coins were not based on the Shroud- is this a "saturated probability" whereby you took account of all of the various probabilistic resources available (both specificational and replicational resources).

Hugh uses an example of his saying what are the odds that he could get flip a coin and get heads ten times in a row. At face value that seems very improbable but if one is able to flip 400 coins rather than just one to get this result the odds of getting 10 heads in a row go up considerably. This relates to your study on the Shroud as again you were only able to get these statistical results on one or some coins but not all of the gold solidus coins (thus it seems you had many replicational resources to draw upon to get the odds you did).

C) Finally, you selected or specified about 15 or so features of commonality between the coin you used in your analysis and the Shroud, but what about other features that did not match that one might expect to be on the coins had the Shroud been used as the template. Did you take into account all of the possible specificational resources that were available in your statistical calculations?

A) If I understand correctly you say that Hugh Farey and Bob Rucker state that "*They are unsure how one would be able to demonstrate a proper statistical basis to provide an accurate objective probability as you claim to have done.*" and in this case I must say that they are perfectly correct.

In fact, I don't know that it is possible to assign perfectly objective probabilities in the probabilistic model that I have treated. I have already explained this before, clarifying how I then tried to circumvent the problem by assigning a suitable band of statistical uncertainty to the statements considered.

Incidentally, I know that some persons go out of their way to denigrate my scientific results, because they are irritated by these results that clearly confirm the full authenticity of the Holy Shroud.

B) I've explained earlier in quite some detail why I only considered one coin and I don't want to repeat myself here.

Instead, I am amazed by the statement you report here about the tosses of 400 coins, which appears clearly biased and tendentious, and formulated to deceive the public. Let's see the proposed example.

Since I have a 50% chance of getting heads or tails from a two-sided coin, by the principle of compound probabilities I have 0.5 multiplied 10 times by itself and get  $1/1024 = 0.000976$ , in other words I have a one in 1024 chance of getting heads or tails on the same coin after 10 tosses.

If instead I have 400 coins, for the principle of total probabilities, I have to multiply the result just obtained for a single coin by 400 and I get a probability of  $400/1024 = 0.39$ . That is, I have one probability in 2.56 of getting ten heads or ten tails on at least one of the 400 coins thrown.

But in the case of coins, and here is the malice of the sentence, I didn't go looking for the one coin that met my requirements among the 400 coins available on the market, instead I looked for a coin that was as representative as possible of all 400 examined!

In any event, in the case under consideration, if we had 7 possibilities out of a billion billion chance for a single coin, we would have about 3 possibilities out of a million billion if we could have chosen the coin out of 400; still practically a result tending to zero which would demonstrate again the impossibility for the engraver to mint that coin without having seen the Holy Shroud.

But, given that all 400 coins under analysis have the same features, the probabilities remain those declared of 7 out of a billion billion chance.

I challenge who have made this objection to provide me with a gold solidus of Justinian II minted between 692 and 695 depicting the face of Christ in good condition, of his own choice, and which does not lead to a result similar to the one I have obtained.

C) Obviously the probabilistic models that I have considered are simplifications of the physical reality under analysis and consequently it would be almost impossible to consider all the features present in the image of the face considered.

Just for this reason, in the new book I wanted to perform a statistical analysis based on points different from those considered in the previous book, and I have seen that the result practically remains unchanged.

The Byzantine engraver must have seen the Holy Shroud or a beautiful reproduction of it.

I also respond to the malicious insinuation that notes the lack of having considered in the probabilistic model characteristics that are present on the face of the coin but which are not present on the Shroud image.

Indeed, in the necessarily simplified model I did not take those characteristics into consideration because I considered them of minimal importance and therefore they would have complicated both the modeling and the calculation of the result for no valid reason.

Let's take an example. The face of Christ of the gold solidus subjected to probabilistic analysis shows the ears as all human faces, while the face of Jesus of the Holy Shroud does not. As I have already said, the Byzantine engravers did not take care of reproducing all the features observed on the Relic in reproducing their images on the coins and among these sometimes also that of the ears.

But if we wanted to introduce this negative feature into the probabilistic model, we could state that the probability that ears are visible on a human face is at least 99 out of 100 chances. Therefore, introducing this additional information in the model, we would have to multiply the obtained result of 7 out of a billion billion chance by 0.99 and practically the result would remain unchanged.

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6. Would you be able to explain your FT-IR, Raman Spectroscopy, Tensile Strength and newest X-Ray dating tests and the results you obtained from them?

To answer this question in sufficient detail, the listeners would first need to have taken specific courses regarding the methods used.

However, I think it is enough for them to know that to carry out these dating methods, some optical, chemical and mechanical properties of the flax fibers were chosen which show changes that can be quantified over time on the basis of appropriate physical laws.

To achieve this, we proceeded according to the following steps.

- 1. We have identified a material property which varies over time and which should not visibly depend on other factors.
- 2. We used a sufficiently numerous series of reference samples, ancient linen fabrics in our case, for the calibration of the method and the definition of the equations of the treated model.
- 3. Before proceeding further, we sought and found theoretical confirmations of our obtained experimental results, also verifying the independence of the result from other effects such as temperature and humidity.
- 4. We measured the property under examination by introducing the sample taken from the Holy Shroud into a commercially available, or purpose-built machine as in the mechanical case, capable of providing the age of the sample under test.

We proceeded according to this scheme in the measurement of the respective parameters with the four methods:

- A. FT-IR and Raman which are based on infrared and laser optical analysis,
- B. Tensile Strength which is based on the mechanical strength of the single flax fiber and
- C. X-Ray detection of cellulose depolymerization.

In all cases we obtained results contrary to the C14 dating of 1988 which we know is scientifically unreliable for various reasons, but all extraordinarily coinciding with a dating to the first century after Christ, the time when Jesus Christ lived in Palestine.

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7. In general, Shroud skeptics question the reliability of these new types of dating methods that haven't been proven or accepted in wider scholarship or Accademia. For example, a non-destructive dating method would be an invaluable tool for archaeology, and, indeed, any alternative dating method could act as a valuable cross-check in cases of uncertainty. Unfortunately, neither mechanical deterioration, nor X-ray diffraction, nor lignin deterioration (Rogers) has achieved any recognition in archaeological circles. What do you make of this objection?

All these superficial and tendentious criticisms made by people who are often ignorant of the subject and who therefore probably do not sufficiently understand the subject being treated are irritating and annoying.

These seem to me, almost always, criticisms formulated on the basis of a non-scientific preconceived objective, of another origin perhaps even religious, which they want to satisfy at any cost, even ignoring the evidence, the goal of having to demonstrate, that the Holy Shroud is not authentic.

For example, it is here stated more or less directly that the method of mechanical dating of flax fibers is not reliable because no one but me has used it to date their archaeological finds.

But, before defaming a method that is at least interesting, is anyone, who makes these denigrations, aware of what it needs to be done to obtain a reliable result?



Does he know that at least twenty fibers selected as free from defects must be taken under a microscope and glued into suitable specially constructed supports?

Is he aware that typically, with the current procedure being improved, about half of the fibers fail to give reliable results for various mechanical assembly problems?

Does he know that to get the Holy Shroud results I had to employ my university students for hundreds of hours?

Does he know that if used for commercial purposes, a single result obtained from this method would be economically unfeasible because it would have to cost at least a dozen thousand dollars?

To make a parallel, the news has recently come out that a method for obtaining nuclear fusion has been discovered in the United States. However, it has been stated that it will take at least 50 years before the discovery can be used by the population to obtain clean energy. Well, let's wait we too for 50 years and we will see if the mechanical dating method will be engineered and used for archaeological purposes!

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8. I've heard some raise the possibility of fraud in that we do not have proof that the samples you use to test are in fact from the Shroud. How do we know that the samples being tested on really are from the Shroud?

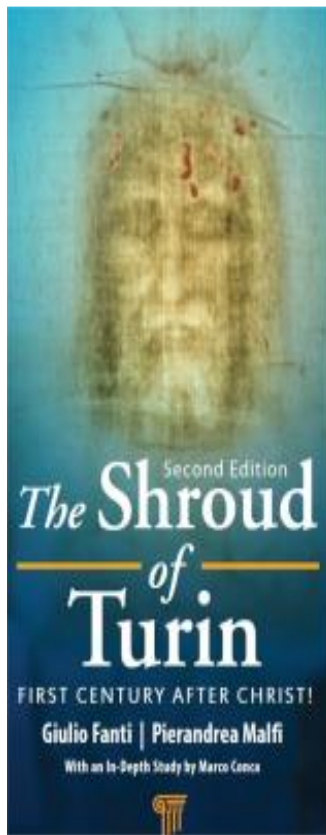
This is a wicked question and I hope you just pass on the thought of others without sharing it. And you think I've spent over 25 years of my life on a fraud?

I'll answer you with a fact: in 1988 during the sampling of the Holy Shroud for C14 dating, cameras were used for several hours to objectively document the sampling, but these cameras did not record the moment in which the experts went to another room to seal the samples just taken.

This lack of visual documentation may suggest that there was a replacement of the samples taken from the Holy Shroud with others of known date.

Similarly to what you imply, if there is no a minimum of confidence in the experimenter, then I could say that the 1988 C14 date is false because the samples have been replaced.

As for my Holy Shroud samples, see for example PHOTO#7, I officially received them with signed documentation, which I also published in my book written with P. Malfi.



PHOTO#7



Figure A.32 Delivery note for Fanti of sindonic material from Riggio di Nemana, Fondazione 3M, July 12, 2006.

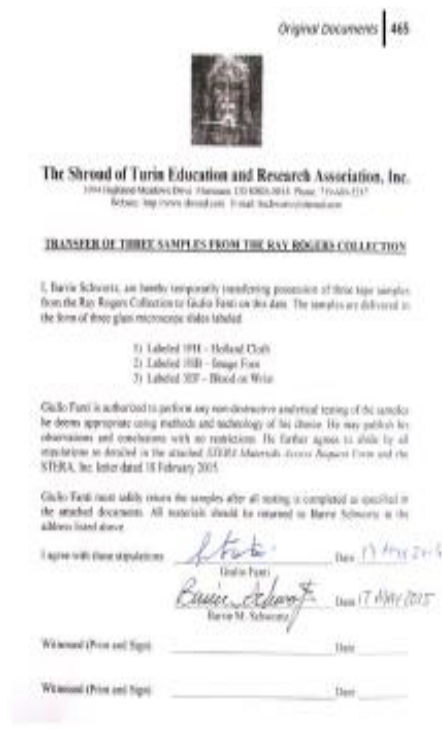


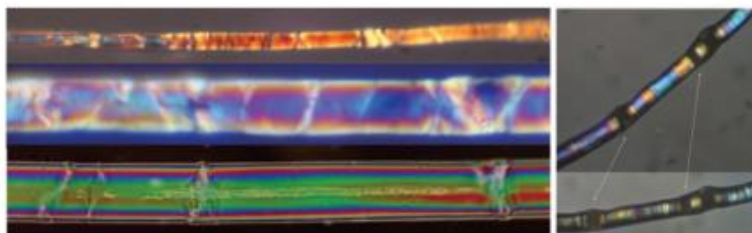
Figure A.34 Official document of the 2015 meeting in Turin during which B. Schwartz loaned three STURP sticky tapes to Fanti.

In this photo we see on the left the cover of the book where the following documents are published: in the center one of the various deliveries to me by the 3M Foundation of Milano Segrate and on the right the document of transfer to me by STERA Inc. of samples of sticky tape taken from Ray Rogers in 1978.

Finally, I must observe that the linen samples from Holy Shroud, see PHOTO #8, are easy to recognize because they have very rare physical and optical features.



**Figure 5.6** On the left: Schematic drawing of the “Z” twist and the “S” twist yarn. On the right: Magnification of the Shroud cloth of Fig. 1.5 in which we clearly see the clockwise twisting (“Z” twist) of the flax fibers into yarn.



**Figure 5.10** On the right, the particular coloring, like a coral snake’s, of the Shroud’s flax fiber observed under a petrographic microscope in doubly polarized light with two different rotations of the analyzer (the arrows indicate areas that correspond to each other). Let us note the presence of defects (knots) on the fiber: On the left, above and at the center, details of fibers, coming from the Shroud, seen in cross-polarized light; for comparison below there is a modern flax fiber. The average diameter of the fibers turned out to be 0.012 mm (0.0005 in.).

PHOTO#8

As seen in the photo above, Holy Shroud threads have a Z-twist that is the opposite of the S-twist that almost all woven linen threads have.

Furthermore, as you can see in the figure below, the coloring of the individual fibers coming from the Holy Shroud have a particular shape if they are seen in cross-polarized light under a petrographic microscope. We also see on the right that the same fiber of the Holy Shroud changes its coloration if the polarization angle is rotated.

Obviously, I carried out checks of this type on the samples officially supplied to me.

\*\*\*\*\* 9

Hugh’s objections to your X-Ray Dating method;

9. Hugh Farey says that “whole threads were used, not just individual fibres. This may be significant, as it was noted above that about half the fibres from any single thread were considered unrepresentative by Fanti. It is not at all clear whether all the previously rejected but now included fibres were similarly unrepresentative, or if, in the final analysis, the new data means anything at all.” How do you respond to Hugh on this?

Also, why are there no margins of error or degree of certainty for your X-Ray dating (is it a 95% degree of certainty that the Shroud dates to the first century as it was for the 3 prior test combined)?

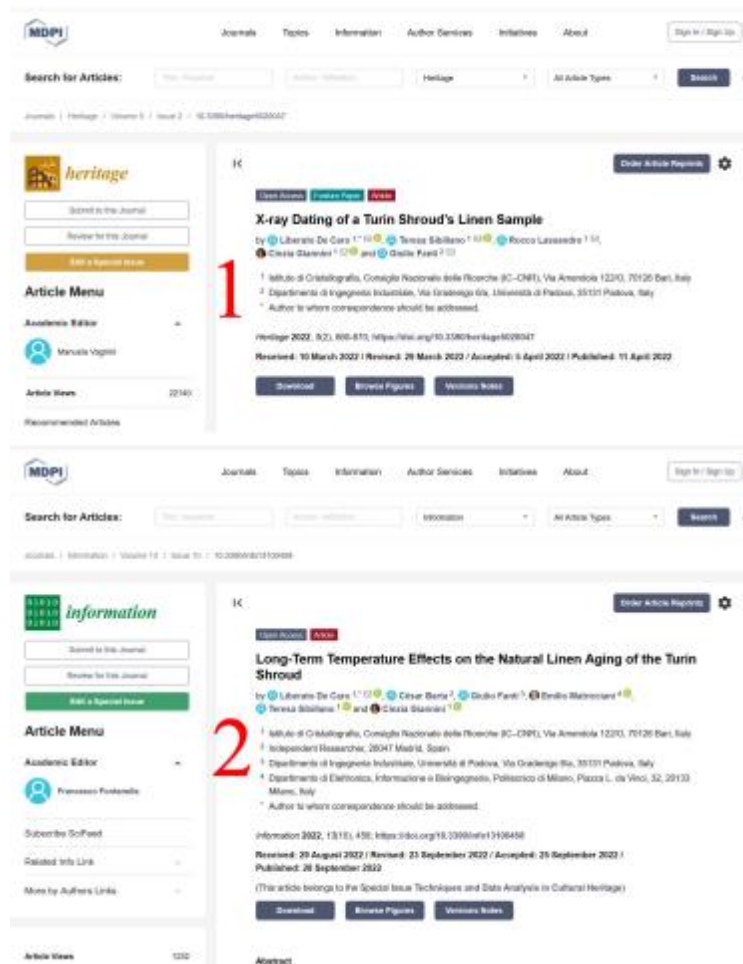
Knowing that who posed this question read my works in detail, one can have a strong doubt about the intelligence of the person who formulated this question. However, I observe his fine intelligence and his astuteness which, with this question, exploited the obvious unpreparedness of many listeners to instill in them doubts about the reliability of my results.

Let me explain. Anyone who has read my works knows that the individual fibers of the Holy Shroud were sampled either by means of adhesive tapes placed in contact with the fabric or aspirated with a suitable device. It is therefore obvious that these samplings acquired both the linen fibers from the Holy Shroud and the material that contaminated the Relic for two thousand years.

In the samples taken in this way, it is therefore easy to think that there are many fibers different from those of the Holy Shroud and that therefore it is necessary to apply a subsequent method of analysis for their recognition.

Unless, and this is an extremely absurd hypothesis, whoever formulates the accusation seems to think that I myself spun the fibers thus taken, to form a new thread to be studied. A thread from the Holy Shroud was obviously spun 2000 years ago using fibers of flax of the same species. So, the allegation that I analyzed a thread containing half of the unrepresentative fibers is clearly false and absurd.

As for the uncertainty that has not been assigned in the cited work on X-ray analysis, see paper #1 in PHOTO #9, it has been estimated to be of the order of very few centuries.



PHOTO#9

It was preferred to omit it in this first work because it was our intention to publish it in the second work published some months later, see paper #2 in PHOTO #9, where we focused more on the effects of humidity and temperature of the sample of the Holy Shroud exhibited in the various cities of the its historical journey.

In this work we have in fact considered the different possible historical paths proposed for the Holy Shroud by different scholars and for each of them we have evaluated the uncertainty corresponding to the dating performed.

It is frustrating to see what level of accusations people go to, against the authenticity of the Holy Shroud, in order to try to convince some of the listeners, that the most important Relic of Christianity may not be authentic!

\*\*\*\*\* 10

10. Sample selection- For his first set of experiment, samples labelled A to N (with several omissions and duplications) were found, eleven of which are listed, and from which 139 fibres were extracted. Eventually only 46 of these contributed to the results. This is too subjective to be credible. The WAXS experiments used whole threads from the same selection, although over half the fibres from these threads were rejected as unsuitable for the first experiment. (For example, one of the samples (LII) was from Egypt. 10 fibres were extracted, of which only 3 were found suitable for the first set of experiments, but the whole thread was used for the WAXS experiment.).

I consider this an insult to my professionalism as a university professor when it is declared "*This is too subjective to be credible*", but frequently, when the arguments to defend one's thesis are scarce, the person who produced the results is directly attacked.

Therefore, I do not get down to defend myself against accusations coming from a person who – from what I know - has never been a university professor, and that at most should be discussed at the table by clarifying the individual details.

Instead, I limit myself here to provide a satisfactory answer to the listeners.

The man who accuses me, probably deliberately, forgets that the assembly procedure for the fibers analyzed from a mechanical point of view, was very delicate and for various reasons only about one out of three fiber could provide results without breaking or sliding from the support.

As for the use of a whole linen thread coming from the Holy Shroud, I have already answered before, and I repeat that it is unthinkable and absurd to affirm that half of the thread is unsuitable!

\*\*\*\*\* 11

11. Factors involving deterioration- Whereas radiocarbon dating is almost entirely due to the age of the sample, and is unaffected by environmental conditions - a bone from a body buried in a clean dry tomb 500 years ago comes out much the same age as a beam from a house derived from a ship's timber cut down 500 years ago - mechanical and chemical properties vary very widely



according to temperature, humidity, acidity and mechanical deformation. All Giulio's control samples (the ones that finally contributed to his calibration graph) were from very similar environments - the Middle East - while the Shroud has had a largely unknown but quite definitely variable history of environmental conditions as it moved around Europe, if not the Mediterranean.

Why didn't you use a much wider selection, including linen from, say, Peru (which you [Fanti] entirely rejected, medieval Europe, which was never considered, or for that matter Japan or Canada. Only using textiles from burials in Middle Eastern tombs, even if from different eras, is too narrow a field for a fair comparison with medieval linen.

It is not at all true that carbon 14 dating is unaffected by environmental conditions. Already Prof. Phillips said in the important journal Nature of 1989 that the carbon 14 dating may have been influenced by the energy that produced the Holy Shroud's double body image, image that is still unexplained scientifically today.

Furthermore, the radiocarbon dating of Egyptian mummy n. 1770 kept in the Manchester Museum provided different ages for the bones and the bandages; these last, were about 900 years "younger" than the bones. If the radiocarbon dates were trustworthy, it would lead to the absurd conclusion that the corpse would have been wrapped in the bandages about 900 years after his death! The obvious explanation for this is due to the effects of the environmental conditions.

This hypothesis was at least partially confirmed by me in a recent publication, see PHOTO #10, in which I reported the results of an analysis of the elements contained in a microscopic sample of blood taken from the Holy Shroud.

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## Could an anomaly in Turin Shroud blood reopen the 1988-radiocarbon-dating result?

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### ABSTRACT

This work proposes an explanation for a blood anomaly found in the Turin Shroud (TS). Unlike common human blood which contains significant levels of nitrogen (weight percentages of the order of 10%), TS blood shows levels of nitrogen which are lower than the background noise produced by the measuring instrument (about 1%). It is not easy to find an explanation for this result, but if we refer to the hypothesis formulated by T.J. Phillips who first proposed that neutron radiation had acted on the TS and therefore on the blood analyzed, it is possible to qualitatively understand what may have altered the observed nitrogen levels. The hypothesis of T.J. Phillips proposes that neutrons would have irradiated the TS, changing some of the nitrogen nuclei to different isotopes. In particular, it would have caused **nitrogen atoms to be transformed into  $^{14}\text{C}$  and so the results of the radiocarbon dating** of the TS performed in 1988 would have **to be corrected** to allow for the corresponding systematic effect hypothesized in that paper.

PHOTO #10

Unlike common human blood samples where nitrogen is evidenced among other elements in the relative spectra, in the sample from the Holy Shroud the trace of nitrogen is so small that it hides behind the background noise.

This therefore is a strong indication that, following the hypothetical intense radiation that produced the double body image, the nitrogen present in the blood was transformed into C14, thus altering the isotopic ratio between C14 and C12 and therefore heavily altering the value of the hypothetical age of the analyzed sample.

Those who criticize me about the samples selected seem not to realize the hundreds of hours that my students and I spent analyzing from a mechanical point of view the fibers used for the calibration of the method, after the effort I made to recover those ancient fibers. Why doesn't he provide me with all the material he criticizes me for not using?

Who criticize me then seems that he has not read my papers because I had to discard some ancient samples from the analyses such as that of Lima, Peru for mechanical reasons.

Furthermore, the general criticism made to me regarding the lack of analyzed samples seems only malicious because, as I wrote in my papers, this method of mechanical dating still needs to be perfected and for this reason the uncertainty assigned to the result is still high, plus minus 400 years.

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12. For the WAXS experiment, a thread was taken from the "radiocarbon corner," which, according to people who object to the radiocarbon date, was the worst possible place to take a representative sample of the Shroud from.

It seems very strange to me that this person, opposed to the authenticity of the Relic and still one of the few defenders of the highly criticized 1988 C14 result, would make an objection of this type.

If for this person who now, in order to criticize the results of my decades-long studies on this subject, embraces even for a moment the idea that the corner from which the sample was taken was unreliable and scientifically incorrect because it was contaminated, it means that he himself questions the result of the radiocarbon dating which up to now he defended against all logic. Well, this means that little by little we come to the Truth.

I used a piece of thread coming from that area because the crystalline properties of the cellulose do not depend on the alleged pollution. Indeed, the X-ray analyses performed have just highlighted the presence of contaminants such as calcium carbonate, but obviously this result did not affect the dating of the sample to the first century after Christ.

\*\*\*\*\* 13

13. Any other issues or challenges about these dating methods that you feel is important that I haven't asked about and you would like to address?

Obviously, regarding the new dating methods, being new, they will certainly have to be improved and engineered in the next future for wide-ranging applications in archaeology. However, it is very significant that all dating methods agree with a first century AD age for the Holy Shroud. The only method that has provided discordant results is that of C14 which, however, we know was statistically unreliable.

Before closing, however, I would like to mention an extremely important fact that did not emerge from today's interview.

The Holy Shroud shows a double body image which is not scientifically explainable and therefore not even reproducible. After more than 25 years of studying this Relic, I am sure that this image is the proof that Jesus Christ wanted to leave us of His Resurrection.

The double body image imprinted on the Holy Shroud is the only image of the whole body that Jesus wanted to leave us. This image is very significant, even if not easy to interpret. In fact, according to Pope Benedict XVI, it is the "*Mystery of Cross and of Light*". In it we see the signs of the immense pains suffered during the Passion of Jesus, but we also see the signs of His Resurrection.

One can then think to the following question: why Jesus wanted to leave us this message imprinted on the most important Relic of Christianity? My personal answer is that we too, pilgrims on Earth, must carry our cross, in order to try to become citizens of Heaven in the future.

Unfortunately, this proof of Resurrection pushes many persons to do everything to denigrate and discredit it and, at the end of this interview, I am compelled to put in evidence again that the criticisms raised against the results here discussed, highlight the malice toward truth-seekers inherent in science.

These persons know they are not right, but they make the public, which cannot be expert in such specific subjects, believe they are. I consider the attitude of these persons a clear insult to the efforts of serious scientists who for years dedicated their lives to the discovery of valuable information still hidden in the most important Relic of Christianity.