

# 2017 – Pasco, Washington Conference

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Abstracts – Information About the Presentations

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## *Overview of the Shroud* — Robert Siefker

The presentation is a Critical Summary of observations, data and hypotheses related to the Shroud of Turin covering Historical Evidence, Medical Forensic Evidence, Linen Cloth Evidence, Image Characteristic Evidence, and includes a review and evaluation of the major Image Formation Hypotheses that have been proposed over the last 100 years. The presentation is based on a publication of the Turin Shroud Center of Colorado (TSC) that is headed by John Jackson (PhD in physics) who headed the landmark Shroud of Turin Research Project (STURP). The TSC publication is entitled “The Shroud of Turin: A Critical Summary of Observations, Data, and Hypotheses” which includes many pieces of data that trace their source back to the research conducted by the STURP team, as well as data from the broad spectrum of other scientific and historic research that has been conducted on the Shroud, both before and after the STURP expedition.

## *The Crown of Thorns: The Paradoxical Lordship of the King of Kings* — Andrew Dalton

Following a description of the wounded head in the light of natural reason, I turn to the Biblical witness to explore the theological meaning of the crown of thorns. In short, we will see that: 1) Thorns first appear as a punishment for Adam’s sin (cf. Gen 3:18). 2) For Jesus, thorns are a metaphor for moral evil (cf. Matt 7:16f). 3) Thorns enter into the typological relationship between Isaac’s sacrifice and the death of Christ (cf. Gen 22). In Jesus, God provides the Passover Lamb, who takes away the sins of the world (cf. John 1:29; 1 Cor 5:7). Finally, deep irony lies behind the mock worship, “Hail, King of the Jews” (Matt 27:29): whereas worldly despots lord it over their subjects (cf. Mt 20:25), this good shepherd lays down his life to save his lost sheep (cf. John 10:11). Christ is an upside-down king in a paradoxical kingdom. Appropriately, he wears a crown of thorns.

## *Exposition of John 20* — Fred Boltz

This presentation looks at the description of Jesus’ tomb as seen by Peter, and the Beloved Disciple (John 20) in light of Gospel themes, special vocabulary, the internal unity of the Gospel, and the revelatory message inherent in the scene as described. Its proposal for the

proper translation of verse 7 differs from what one finds in standard Bible translations, because translators do not take these other matters into account. Scholar/commentators do, and reach different conclusions from translators at times. So, we propose: “He (Simon) observed the linen cloths lying, and the sudarion, which had been upon his head, not lying with the burial cloths, but separate from view where it was at first.” In other words, the sudarion was still within the shroud. No other way of understanding verse 7 can stand. What Peter observed was the outline of the sudarion, repurposed as a chin band. This should be the starting point for evaluating whether the Shroud of Turin and the Sudarium of Oviedo comport with the biblical evidence.

### *The Role of Epistemology in Approaching Truth in the Shroud of Turin — Cheryl White*

From the time of the ancient Greek philosophers through the Age of Enlightenment and the Scientific Revolution, man has presumed the existence of universal truth as something that is accessible and knowable. From the Platonic Doctrine of Forms that established the foundations of what would become a faith-based epistemology seeking ideal and perfect forms, to the Aristotelian universe of the Unmoved Mover using an epistemology of observation and external proofs found in nature, philosophy has progressed to incorporate each of these as means by which man comes to understand all aspects of life and his existence. Throughout late Classical Antiquity and into the High Middle Ages, philosophers such as St. Augustine and St. Thomas Aquinas assured that each of these epistemologies found further expression in western Christian thought. The Neo-Platonist St. Augustine and the Aristotelian St. Thomas Aquinas gave credibility to each of these approaches to knowledge, in a way that has continued to inform and influence man’s quest for truth. Over the centuries that have passed since the first mention of the Shroud of Turin in the documented historical record, these epistemologies have largely not been in competition for understanding this relic. The reason for this is found in the nature of the Shroud itself, which continues to reveal new information about itself as new and more sophisticated methods of science have developed. Until the late nineteenth century, those who venerated the cloth did so without knowing the fullness of the photographic image imprinted there, meaning they venerated from a standpoint of faith what they received to be truth, with no further external evidence. Following the exposure of the full image on the cloth, the epistemology applied to Shroud studies has shifted to one of science and empiricism, as it became obvious through observation that the Shroud was much more than a simple medieval forgery or odd artifact. Inquiry and ongoing exploration of the Shroud of Turin must be approached with respect for each epistemology, given their historical association with both man’s quest for knowledge and this specific relic itself. To date, each philosophical construct unnecessarily suffers from a suspicion of the other, and yet each falls short in answering the seemingly unanswerable. Through a historical and philosophical analysis of the ways in which man has approached this unusual and unique cloth, this paper will explore the implications of advancing both epistemologies for future study and progress toward truth.

### ***Physical Cause of Jesus' Death — Pietro Pescetelli***

The Shroud of Turin is a source of information with forensic value. On the light of Synoptic Gospels and using the Shroud as an autoptic finding, the author assumes heart infarction and its complications, heart rupture and hemopericardium, to be the leading cause of Jesus' death on the cross.

### ***Identifying the Tomb of Jesus for Turin Shroud Research — Dean Schulz***

A hypothesis has been proposed wherein particle radiation played a role in the image formation on the Turin Shroud and/or in the skewing of its carbon-14 dating [Antonacci 2001, 2015; Rucker 2016]. If so, and if indeed the man imaged on the Shroud was Jesus, then it would be important to analyze samples of the limestone in the correct tomb where his body and the Shroud were placed. If neutron radiation were involved, detecting the unnaturally occurring Calcium-41 isotope would be convincing evidence to substantiate the radiation hypothesis and associate the Shroud specifically with Jesus. So this paper examines several purported sites for Jesus' burial, evaluates their merit, and proposes sites for future sampling and analysis.

### ***The Mandylion in Constantinople: Literary and Iconographic Sources — Alfonso Caccese, Emanuela Marinelli, Laura Provera, and Domenico Repice***

The ancient Image of Edessa was moved to Constantinople in the year 944. This image, which is called Sindon in some sources, begins to be called Holy Mandylion right in the Byzantine capital. The solemn arrival in Constantinople is extensively described in the *Narratio de Imagine Edessena* attributed to the emperor Constantine VII Porphyrogenitus (10th century). The Sermon of Gregory Referendarius and the *Codex Vossianus*, both of the 10th century, describe the Edessa Image as the image of a whole human body. The Edessa Image is described in the Acts of Thaddeus with the term *tetradiplon* (folded four times). These testimonies contribute to validate the hypothesis that the Edessa Image is actually the Shroud, folded. The depictions of the Man of Sorrows that circulated in Constantinople during the period of the ascertained presence of the Edessa Image find the confirmation of their probable sindonic origin in the literary sources. The authors also investigate the relationship between the Holy Shroud and the new depictions of the suffering Christ that originate in Constantinople in the period of the presence of the Mandylion. The image of the dead Christ, emerging from a tomb with his arms crossed, begins to spread. The image of the crucifix is also transformed: the still-living Christ gives way to the dead Christ, who is also depicted when he has just been removed from the cross and put on a sheet. These depictions seem to be referring to a progressive knowledge of the true nature of the Mandylion: a cloth with the entire image of the dead Christ. The existence of the Throne of the Magnaura is well-known; we can hypothesize the existence of a similar mechanism to exhibit the Mandylion-Shroud with equal authority. To confirm what has been stated above, the authors present some significant iconographic testimonies.

### ***Who Saw the Mandylion and What was its Size? — Mario Latendresse***

The Abgar Legend recounts the story of the creation of a miraculous image of Christ, the Image of Edessa. In 944, the Edessenian image is transferred to Constantinople and becomes known as the Mandylion, which is represented as a cloth impressed with the face of Christ. Despite the work of many scholars on the origin and nature of the Mandylion, its exact size and appearance have not been conclusively settled. We address two specific questions: who saw the real Mandylion? What was its size? Answering these questions requires a study of many essential documents: the Abgar Legend; the medieval renditions of the Mandylion; the manuscripts describing the arrival and the keeping of the Mandylion in Constantinople; the pilgrim's stories mentioning the Mandylion in Constantinople; the manuscripts describing the arrival and keeping of the Mandylion and its reliquary at the Sainte-Chapelle of Paris; and more. It appears that very few may have seen the Mandylion in Edessa, Constantinople and Paris.

### ***Geoffrey de Charny's Acquisition of the Shroud of Turin: Texts, Fictions, and Forgeries — Jack Markwardt***

In approximately 1355-1356, the Shroud of Turin was publicly exhibited in the small French village of Lirey. The manner in which its then-owner, Geoffrey de Charny, an esteemed knight, acquired the relic has remained unknown for more than six and a half centuries. Over the course of the last one hundred and fifteen years, various hypotheses have attempted to explain Geoffrey's ownership of the relic, each of which proceeds upon the assumption that the Turin Shroud was the imaged sindon which, in 1203 and 1204, was publicly exhibited in Constantinople. This paper will analyze the fifteen most prominent of these theories and the historical texts, the historical fictions, and the historical forgeries upon which each of these narratives is based. It will examine the various proposed chains of ownership which run from the Byzantine emperor to Geoffrey de Charny, assess the plausibility of their component links, and review the multiple factors which determine whether such theories should be, or should not be, considered convincing.

### ***There is no Evidence that Othon de la Roche Acquired the Shroud of Turin — Mario Latendresse***

In 1714, the Jesuit Pierre-Joseph Dunod wrote a dissertation for the authenticity of the Shroud of Besançon, and that Othon de la Roche had acquired the Shroud of Christ during the Fourth Crusade. That dissertation is in manuscript 826 of the municipal library of Besançon. In 1902, Dom François Chamard modified the arguments of that dissertation concluding instead that Othon's acquisition is the Shroud of Turin. In 1981, Pasquale Rinaldi presented a copy of a supposed letter of Theodore Angelos Komnenos Doukas to Pope Innocent III, supposedly written in August 1205, stating that the Shroud of Christ was being kept in Athens. Several researchers have claimed that a "family tradition" substantiates that a small coffer at the castle of Ray-sur-Saône had been used to transport the Shroud of Christ

from Athens to France. These primary sources have been used to substantiate several theses for the transfer of the Shroud from the Middle East to the collegiate of Lirey. In this presentation, I show new evidences that these sources have no reliable historical foundation.

### ***The Shroud of Turin and the Sainte-Chapelle of Paris — Mario Latendresse***

The provenance of the Shroud at Lirey, France, has often been considered obscure. However, there is a direct and natural route for its provenance by following the fundamental historical documents: the receipt of Humbert de Villersexel listing the relics of Lirey; the notice Pour Scavoir la Vérité; the statements of Marguerite de Charny and her father Geoffroy II; and documents related to the financial supports for the collegiate at Lirey. These documents lead to the relics in the Grande Châsse of the Sainte-Chapelle of Paris, which contained twenty-two relics received from Constantinople in 1239-1242. The only possible relic similar to the Shroud in the Grande Châsse is the Sanctam Toella tabula insertam (A Holy Cloth inserted in a table). I will present a detailed analysis of the French inventories of the Grande Châsse showing that the Holy Cloth likely disappeared from the Sainte-Chapelle before 1534. This analysis answers many objections that were raised against the thesis of the Sainte-Chapelle. Based on historical documents, I will also propose a new place and date for the transfer of the Shroud from King Philippe VI to Geoffroy de Charny.

### ***The image of Edessa included the whole body but only its empty reliquary arrived at Paris — Cesar Barta***

It is proposed that the image of Edessa was inside the shrine covered with a Tallit. This originated the Aura of Jesus. When the Mandylion was moved to Constantinople, several references show that the image involved the whole body. The way to show this shroud described by Clary should be the origin of the Imago Pietatis. Some paintings of this last show the back of the man in the backside of the canvas. We propose a new hypothesis: the Mandylion kept in Edessa in a reliquary opaque becoming an empty reliquary in Constantinople. Only this empty shrine was sent to the Sainte Chapelle of Paris.

### ***The Simony Theory: The Passage of the Shroud of Turin from Constantinople to Lirey — Jack Markwardt***

If, as many believe, the Shroud of Turin was the sindon which bore a full-length image of Jesus and was publicly exhibited in Constantinople at the beginning of the thirteenth century, its movements and whereabouts during the so-called “Missing Years” (1204- 1355) remain a mystery, as does the manner in which it came to be acquired by its first record owner, Geoffrey de Charny, a French knight who exhibited the cloth at Lirey in 1355 and 1356. This paper presents a completely new theory of the Shroud’s passage from

Constantinople to Lirey, one which is entirely consistent with historical texts, presents plausible transfers of the relic, and explains why Geoffrey and the Church did not speak about the relic's provenance, why the Pope imposed perpetual silence regarding the cloth, and why, for almost seven centuries, the "Missing Years" have been missing.

### ***Avignon and the Shroud of Turin: Authenticity Confirmed — Jack Markwardt***

The circumstances which surround the fourteenth-century exhibitions of the Shroud in the small French hamlet of Lirey continue to confound historians. The initial expositions go unreferenced in Vatican archives and appear to have proceeded without papal approval. With regard to the later expositions, the sanctioning Pope concealed his reasons for allowing them to take place, silenced a bishop who alleged the relic's fraudulence, and issued three inconsistent bulls regarding how the cloth was to be described when exhibited. In addition, both the relic's owners and the Church never publicly disclosed its provenance. This paper will resolve all of the mysteries which surround the Lirey exhibitions and demonstrate that, before they were permitted to commence, the Church determined that the Shroud of Turin was an authentic relic of Jesus Christ. For five centuries thereafter, the Vatican referred to the Shroud as Jesus' actual burial cloth; however, for reasons which this paper will reveal, the Church now alludes to the relic as an icon, or image.

### ***Uncovering the Frailties of Ecclesiastical Authorities in the Holy Shroud Guild Archives — Giorgio Bracaglia***

The ultimate contribution by the Holy Shroud Guild was to lead an American team of scientist during the 1978 Ostension. The occasion marked the first time that Americans were part of an international collaboration in Shroud research. However, in less than two years, the relationship between the American scientists, and Turin's ecclesiastical became embittered. Many blame the dissent of Doctor McCrone, who insisted the Shroud was a painting, while others faulted Professor Gove beginning in 1977, for sabotaging STURP's involvement during the 1988 radiocarbon testing, or Father Filas announcement of the Lepton coin. As damaging as the McCrone, Gove, and Filas' incidents appear, assessing the total summation of all the Guild's archives during the American cooperation there does emerge one underlying cause for the collapse of international collaboration. This presentation explores one episode of many that collectively demonstrates the cause that eroded the collaboration between the groups.

### ***Sources of DNA on the Shroud — Gianni Barcaccia***

The main findings from the testing of genomic DNA extracted from dust particles vacuumed from distinct parts of the Turin Shroud are presented and critically discussed. Several plant taxa native to the Mediterranean area were identified as well as species with a primary center of origin in Asia, the Middle East or the Americas but most likely introduced in a

historical interval later than the Medieval period. Regarding human mitogenome lineages, our analyses detected sequences from multiple subjects of different ethnic origins, which clustered into a number of Western Eurasian haplogroups, including some known to be typical of Western Europe (5.7%), the Middle East (55.6%) and the Indian sub-continent (38.7%). Such diversity does not exclude a Medieval origin in Europe but it is also fully compatible with the historical and geographical path followed by the Shroud during its presumed journey from the Near East.

### ***Use of the VP-8 Image Analyzer with a photograph of the Shroud of Turin exhibiting 3D results — Janis Winchester***

This research uses a VP-8 Image Analyzer, manufactured by Interpretation Systems Inc., with a photograph of the Shroud of Turin. The image emerging on the oscilloscope of the VP-8 shows the information embedded on the fibers of the image on the Shroud of Turin. The findings detail the pattern of the discolored fibers that show wounds of a spear entrance and exit point and other marks of a man who died by crucifixion. The unique feature is the 3D appearance from the 2D photograph of the Shroud of Turin. No other photograph shows this characteristic. A thank you is extended to Shroud Researcher Mr. Kevin Moran for the use of his VP-8 Image Analyzer, and assisting with a video for this presentation.

### ***Numismatic dating of the Turin Shroud through the analysis of Byzantine coins — Giulio Fanti***

The 1988 radiocarbon dating of the Turin Shroud (TS) assigned a calibrated calendar age of 1260-1390 A.D. with a 95% confidence for the linen fabric, but three recent alternative dating methods assigned an age compatible with the First Century A.D., the period in which Jesus Christ lived in Palestine. The present analysis is based on the face and on the posture of Christ reported on many Byzantine coins that clearly demonstrate that the TS was seen starting from 692 A.D., the year in which the emperor Justinian II represented the face of Christ on the coins for the first time in the history. It is interesting to observe that, as not all the peculiar details of the TS face were represented in such a small depiction of a coin, the choice of which detail had to be considered was let to the single engraver. Therefore, we can see coins made by different officials, under the same emperor, showing different details, all typical of the TS face, but with different faces of Christ. With the time passing, not all the engravers had the possibility to observe directly the TS; as a result, a degradation of the similarity with the TS of the produced face of Christ results. Nevertheless, when the TS was taken to Constantinople in 944 A.D., we detect a great improvement of the partially lost similarity. This is also demonstrated by an analysis based on the variation of the ratio between eyes distance and nose length. From a probabilistic analysis, it results that the Byzantine engraver who represented Christ on the gold solidus, semissis, tremissis and silver hexagram during the period of Justinian II would have only seven chances in one

billion of billions of different possibilities of hitting these peculiar features all together without having seen the TS; this demonstrates that the TS was seen in the first Millennium A.D. The paper also presents a tracking shot of the various features, different century by century, but all in agreement with the TS body image, reported in the Byzantine coins up to the fall of the Byzantine Empire in 1204 A.D. and in the following centuries, evidencing the various features of the TS image frequently reproduced in accordance with Byzantine canons.

### ***Hypothesis of face-cloth wrapping of the Turin Shroud Man: experimental and numerical results*** — Gianmaria Concheri, Giulio Fanti and Sergio Rodella

Studies of sheets with the Turin Shroud (TS) body image impressed in them, wrapping a life-size sculpture of the TS Man very recently produced by the sculptor Sergio Rodella, resulted in a preliminary hypothesis of how the TS was posed over the Man. In particular from the preliminary results obtained by wrapping only the face, and measured by means of a 3D scanner, it indicates that the TS wrapped the TS Man tighter than some hypotheses proposed in the past. A very preliminary numerical simulation of the face wrapping is also presented. If confirmed by additional studies performed along the whole body of the life-size sculpture of the TS Man, these results assist in refining the various body image formation hypotheses that, up to now, are not able to explain all the very peculiar features of the TS body image.

### ***Politics of the Shroud C-14 Dating*** — Joe Marino

In 1978, the Shroud of Turin Research Project spent five days studying the linen cloth believed by many to be the burial cloth of Jesus of Nazareth. The group found no evidence that it was a forgery and was unable to determine how the image had been formed. In 1988, laboratories in Tucson, Oxford and Zurich performed a radiocarbon dating on the Shroud of Turin with resulting dates of AD 1260-1390. Using multiple sources, including first-hand accounts by individuals involved in the dating, and a recently-discovered 1989 doctoral dissertation containing startling admissions from some of the principle characters, this paper will show in chronological fashion how the search for the truth of the real age of the Shroud of Turin was compromised by personality conflicts, questionable actions by participants, contradictory and concealed data, and broken protocols. The data recounted indicate that the C-14 results should not be accepted as valid.

### ***Invisible Reweave on the Shroud: Evidence For*** — Joe Marino

When the 1988 Shroud of Turin C-14 dating results were announced as AD 1260-1390, some researchers, based on previous data collected, especially by the 1978 Shroud of Turin Research Project (STURP) that showed no indication that the cloth was a forgery, suggested that the area from which the C-14 sample had been taken was a repaired area. In 2000, the

author, along with his late wife Sue Benford, presented an in-depth paper about the possibility of a repair at a conference in Orvieto, Italy. The late Ray Rogers, a chemist on the STURP team, thought that the hypothesis was nonsense and set out to prove us wrong, as he had samples from the C-14 area as well as the main body of the Shroud. To his surprise, the data he found supported the repair hypothesis. Evidence pointing to repairs is also presented from other important sindonologists.

### ***Was the Shroud of Turin Invisibly Rewoven with Foreign Material at the Radiocarbon Site to Match the Rest of the Cloth? — Mark Antonacci***

This presentation discusses the evidence on the Shroud or its samples of an "invisible" reweave or the presence of any added dye or coating on any material added to the Shroud at or near the vicinity of its 1988 radiocarbon site.

### ***Dating Techniques other than Carbon Dating — Giulio Fanti***

"Statistical Analysis of the 1988 Carbon dating" by Bob Rucker.

In 1988, samples were cut from the bottom corner of the Shroud and sent to three laboratories for C14 dating. Statistical analysis of the results was published Feb. 16, 1989 in the British Journal Nature (P. E. Damon, et al). The average value obtained by the three laboratories (1260 AD) was based on the assumption that only random measurement errors were causing the variation in the measurements, but detailed statistical analysis indicates there is only a 1.4% probability of this being true. This means that it is highly likely (~98% probability) there was also something affecting, or biasing, all the measurement values as a function of some parameter, i.e. it was not random. In statistical analysis terminology, this is called a systematic (in contrast to random) bias. The statistical analysis reported in Damon did not recognize the presence of this systematic bias. Since the presence and nature of this systematic bias was not recognized, the effect of it could not be corrected for in the measurement values. Therefore, the C14 dates should not be regarded as accurate because the measured values were not corrected for whatever was affecting them, i.e. the systematic bias.

### ***The Neutron Absorption Hypothesis — Bob Rucker***

Detailed statistical analysis of the C14 dates indicates that something other than random measurement error was affecting the measurements. Plotting the average values from the three laboratories indicates that the C14 dates change by about 36 to 38 years/cm (91 to 97 years/inch) as the sample point moves away from the bottom edge of the Shroud and toward the center of the body mass. There is much evidence that the straw-yellow discoloration on the Shroud was caused by a burst of radiation from the body. If this burst of radiation included neutrons, then the shape of the neutron distribution in the tomb as calculated by the MCNP nuclear analysis computer software would have caused the 36 to 38

years/cm slope in the calculated values by the [N14 + neutron C14 + proton] reaction. The hypothesis that neutrons were included in the burst of radiation explains the four things that are known about C14 dating and the Shroud (1260 AD date, slope of 36 to 38 years/cm, range of the measured values: 1155 to 1410 AD, and a 700 AD C14 date for the Sudarium of Oveido). The alternate explanation of an invisible patch or reweave is only supported by the first two items.

### ***Art, Icon, or Relic — Russ Breault***

This is a presentation on the role of art in exploring and revealing an ancient mystery. Is the famous Shroud of Turin the work of a medieval artist? Is it a religious icon or is it a relic of a historical event? This comprehensive presentation will look at art as historical depiction, art copies of the original, the influence of the Shroud on Byzantine art, comparison of art during the middle ages, and mechanics of art such as style, technique, substances and process. This presentation includes over 200 images. 90 minutes.

### ***Explaining the Color of the Blood on the Shroud — Paolo Di Lazzaro, A***

Di Lascio, P. Iacomussi, M. Missori, and D. Murra.

One of the most puzzling scientific problems of the Turin Shroud (TS) is the carmine color of the bloodstains, since they are at least several centuries old. We do not know any other old bloodstain on cloth that is still colored carmine. This simple observation rules out “physiological” explanations and opens two different hypotheses: the bloodstains contain a mix of blood (as found by Baima Bollone and independently by Heller and Adler) and a reddish paint (as found by McCrone), or the blood marks on the TS were exposed to a unique factor that changed the blood chemistry. As an example, Goldoni proposed the hypothesis that the high concentration of bilirubin in the bloodstains on the TS could be responsible for the unusual color of the blood marks, after an irradiation of ultraviolet (UV) light suitable to activate photo-chemistry reactions of bilirubin with, e.g., carbon monoxide. In this presentation, we will detail two unpublished results that test both hypotheses, to some extent.

### ***Chemistry of the Image Imprinting Process — Jose Carlos Godinez***

The Turin Shroud is a linen cloth basically made of cellulose. During its bleaching process, a very thin coating of carbohydrates (hexoses) would have been deposited on its surface. Spectroscopic analysis and micro chemical tests on the image area, concluded that aldehydes and carboxylic acids were the only groups allowed to be at the image chromophore having a double bond conjugated system that resulted from the oxidation and dehydration of cellulose or hexoses. The image is not a scorch, however Hydroximetil furfural (HMF) was detected in the pyrolysis mass spectrum. HMF is not solely a pyrolytic product, its formation can also be induced by the photochemical degradation (radiation) of

carbohydrates in a Hydrogen rich environment. The HMF because of its yellow sepia color and a carbonyl conjugated system, can here be proposed as the image chromophore. There is at the image a 131 amu unknown compound. If it is assumed that a Hydrogen strangelet (5 amu) is forming part of the HMF nuclei (MW 126), or just trapped within, it can account for the unknown 131 molecule.

### ***Naturalistic Processes for Image Formation — Mark Antonacci***

This presentation discusses the success or lack of success of naturalistic methods in duplicating the various features on the Shroud's body images and their blood marks.

### ***Role of Information and Radiation in Image Formation — Bob Rucker***

To understand the image on the Shroud, it is necessary to understand the role of information and radiation. Three things were required to form the image on the Shroud: a discolorization mechanism, energy to drive the mechanism, and information to control the mechanism. The information that defines the appearance of a naked crucified man must have been deposited on the Shroud to control the discolorization mechanism. This information must have come from the body. The only option to transported or communicated this information from the body to the Shroud appears to be radiation. Other options for communicating information from one location to another would not work for the image on the Shroud. The radiation that communicated the information to the Shroud regarding the appearance of a naked crucified man could also have provided the required energy to drive the discoloration mechanism. The presence of bones in the Shroud image indicates that the radiation was evidently emitted from within the body. The good resolution images of the front and back of the body, without side images, indicates the radiation was evidently vertically collimated both up and down, like a million vertically oriented lasers going off at once in the body.

### ***Critical Analysis about the Radiation Direction in the Formation of the Shroud of Turin Image — R***

Campion and Giulio Fanti.

Recent studies on the image of the Turin Shroud (TS) lead us to think it could have been formed through a not well identified mechanism of energy radiation. To remove some unknowns about this imaging process, a reverse engineering method has been applied. In particular, the present work has simulated the image formation of a human face on a cloth by using an ad-hoc developed software. The results of three different directions of the radiation have been simulated, each connected with a particular hypothesis of image formation: diffusive Lambertian direction, perpendicular to the emitting surface, and vertical. On the basis of the analysis of the different images produced, some useful comments both about the kind of radiation and the cloth wrapping conditions have been

obtained. The effect of image distortion of a cloth wrapped around a face has been discussed also proposing the most probable law of radiation attenuation with distance. None of the three hypothesis produces an image comparable with that impressed on the TS thus suggesting that this image is due to a directional but more complex radiation whose laws are considered with corresponding boundary conditions.

### ***Characteristics of the Image and Its Formation — Giuseppe Baldacchini***

According to the project STURP and other studies, the Shroud of Turin is not a fake, but its mere existence cannot be explained by science, and especially the remarkable body image that covers its entire length remains a mystery. Here, this serious impasse has been overcome by resorting to a virtual Matter-Antimatter Annihilation process, where the body of the Man of the Shroud disintegrates totally and soon after is restored anew with delivery of a small amount of energy, as allowed by the CP (Charge-Parity) violation, which is spent to mark the Shroud as it looks today. However unlikely this process may seem; its consequences are in a surprising agreement with the experimental evidences. The present hypothesis went a long way to address the ultimate quest of the hidden aspects of the Shroud, but the uniqueness of its marks is still posing insurmountable difficulties for our limited knowledge concerning the still foggy boundaries between life and death.

### ***A Geometric Mechanism for the Image Formation on the Shroud of Turin — Mario Latendresse***

The image formation mechanism on the Shroud of Turin can be divided into two components: the geometry of the cloth versus the body and the physicochemical mechanism forming the image on the cloth. This presentation focuses on the geometry component. I will show that the cloth did not move before or during the image formation because that would be incompatible with the location of the bloodstains relative to the image. In particular, it will be shown that the bloodstains seen in the hair, near the cheeks, are likely from the hair and not the cheeks as it has been proposed. The characteristics of the blood flow do not preclude this possibility and the photograph of the underside of the Shroud of Turin is coherent with this observation. The projection of the image of the body to the cloth can be explained by a simple general law that does not depend on gravity or any orientation of the body.

### ***Linen Coloration by Pulsed Radiation, A Review — Paolo Di Lazzaro and Daniele Murra***

Several years ago, it was demonstrated that very short and intense bursts of Vacuum Ultraviolet radiation could generate a truly Shroud-like coloration at the microscopy level. It is time to rewind the tape and put those experimental results in their proper context: the motivations of the work, the search for the optimum (but hard to achieve) working point,

the photochemistry clues, the repeatability of the results, the scaling up from coloration to image production, what our results have really shown from a strictly scientific point of view, what are the implications in other areas such as philosophy and metaphysics, what journalists (and some scientists too) have misunderstood. The talk will present a fascinating survey of 10 years of experimental attempts, efforts, intuitions, insights, accomplishments, disappointments, controversies.

### ***Chromosome acting as loop antenna matches wavelength for colorization of Shroud of Turin — Tony Fleming***

This presentation asks the question whether there a biological reason for the coloration of Shroud-like linen that was found using a single ArF Excimer laser as reported by Paolo Di Lazarro and a number of others in 2010 and 2012? Supposing the Shroud to be authentic, we can also ask whether there a connection between the coloration of the image found on the Shroud of Turin and the biophysics within TSM's (Turin Shroud Man's) body? Another way of asking this question is: could the many chromosomes within TSM's Body have acted as tiny lasers, many little loop antennas all over the Body emitting UV light perpendicularly outwards from within TSM's skin thus forming the image on the Shroud? This present study looks at the possibility that TSM's chromosomes may have reacted with the Shroud since the wavelengths of both are very close to each other, the chromosomes in TSM's body and the ArF Excimer laser.

### ***Experimental Effects of Coronal Discharges on Linen — Michael Schaffer***

Plasmas can leave a permanent, yellow discoloration in very shallow layers on linen surfaces, very similar to those measured on the Shroud of Turin image. Fanti & colleagues have strengthened the case for a plasma role by experimentally forming Shroud-like images of a linen-draped, 3D manikin using corona discharges. (1) Plasma in the tomb requires a natural energy source. I researched lightning literature and confirmed that even in 3D, lightning's electric field penetrates about as deeply as the common 1D electric skin depth. In dry limestone it is typically 10s of meters, short enough for a nearby strike to make a strong field inside a tomb. (2) My first experimental goal is to produce about 1 cc of plasma in ambient air without carbonizing linen. I could send other researchers small, plasma-exposed linen samples for further study.

### ***Free Electron Model of Image Formation on Shroud of Turin — Chuck Rogers***

A theoretical study is made of expected consequences should a dead body wrapped in a linen cloth be pulled into a universe of higher dimensionality. A Free Electron Model of Image Creation is proposed to explain how its disappearance might create an image on linen. An interface is assumed to open up along the body's midplane and to extend laterally to its edges. This interface expands to swallow the body, while leaving void populated by

free electrons that create charged layers on interior surfaces. When an interface reaches skin, electrons moving in front of it burst out of the body cavity to cast shadows of surface features onto cloth. Photon radiation is generated. Low conductivity of linen keeps charge fixed in place long enough for fibers to oxidize without distorting electronic shadows. Attenuation of electrons in air reduces charge deposited behind air gaps. Patterns of oxidation combine with charge-free areas behind air gaps to create an image of an entire man. At first invisible, the image turns straw-yellow over time and becomes visible.

### ***Image Formation by Charged Nuclear Particles — Arthur Lind***

The cause of the image on the Shroud of Turin appears to be an image not formed by human hands. Because the Shroud radiocarbon dated to 1325, it has been suggested that during the resurrection Christ's body dematerialized and in doing so both neutrons and protons were emitted. The neutrons reacted with the nitrogen in the Shroud to produce radiocarbon, making the radiocarbon date appear to be 1325. The protons produced the image. This presentation will examine if the image could have been formed by high energy protons.

### ***Problems with the Cloth Collapse Hypothesis for Image Formation — Bob Rucker***

According to the cloth collapse hypothesis, when the body disappeared, the forces of gravity and air pressure difference would have caused the cloth to collapse through the "radiant region" where the body had been. The passage of the Shroud through this radiant region would have caused radiation in the region to discolor the cloth causing the image. There appear to be several problems with this concept: 1. Gravity only works downward so would not cause the dorsal side to go up into the radiant region. 2. In a very rapid disappearance of the body there may not be sufficient air flow to the outside of the bottom cloth to cause it to collapse. 3. A slow body disappearance may not produce a sufficient air pressure difference to move the cloth. 4. A significant air pressure difference would also cause the sides of the cloth to collapse, but there are no images of the sides of the body. 5. Radiation, whether particles such as protons or electrons, or photons such as ultra violet, moves much faster than a collapsing cloth could move. Thus, before the cloth had moved significantly, the radiation would have gone through the Shroud leaving no radiation within the so called radiant region. Whether the cloth collapses or not is then irrelevant.

### ***Do we really need new evidence and arguments about the Turin Shroud? —***

***Tristan Casabianca***

Since the 2000's, the discussion about the authenticity of the Shroud of Turin has been reopened in mainstream scientific journals. Over the last few years, new global arguments regarding the ongoing controversy have been introduced. This paper argues that the dozens of recent scientific articles reinforcing the authenticity hypothesis and the development of analytical arguments show that the belief in the authenticity of the Turin Shroud is justified.

But, even if new evidence and arguments are crucial in order to how what a reasonable answer should be, human beings can always, as free agents, hold unwarranted doubts and beliefs.

#### **Panel Discussion on History**

- Cesar Barta (answering questions)
- Mario Latendresse (answering questions)
- Emanuela Marinelli (answering questions)
- Michela Marinelli (answering questions, representing Alessandro Piana)
- Jack Markwardt (answering questions)
- Cesar Barta (asking questions)
- Mark Antonacci (asking questions)
- Joe Marino (asking questions)
- Robert Siefker (asking questions)

#### **Panel Discussion on Dating**

- Mark Antonacci (answering questions)
- Giulio Fanti (answering questions)
- Joe Marino (answering questions)
- Bob Rucker (answering questions)
- Cesar Barta (asking questions)
- Paolo Di Lazzaro (asking questions)
- Robert Siefker (asking questions)

#### **Panel discussion on image formation.**

- Mark Antonacci (answering questions)
- Paolo Di Lazzaro (answering questions)
- Giulio Fanti (answering questions)
- Bob Rucker (answering questions)
- Cesar Barta (asking questions)
- Art Lind (asking questions)
- Robert Siefker (asking questions)