



Front and Back Images on the Shroud of Turin

1. Rigor mortis in the feet. This indicates the victim was dead.
2. Two nails through one foot, one of them through both feet.
3. Fire in 1532 resulted in scorch marks and water stains.
4. Areas badly damaged in the fire were patched in 1534.
5. The Hungarian Pray manuscript (1192-1195) has a painting of a famous burial cloth that had long been in Constantinople. It shows the same L-shaped burn holes that are on the Shroud, so the Shroud must have existed significantly (more than 2 sigma) before the C¹⁴ date of 1260 to 1390 AD. This C¹⁴ date must be flawed.
6. The Shroud appears to show a flow of blood and clear blood serum from a wound in the side. Blood serum is mostly composed of water. Compare with "blood and water" in John 19:34.
7. The Shroud shows 100 to 120 scourge marks from Roman flagrum. Resulting blood marks show blood serum rings (visible only under UV) around the blood particles. Compare with Mk. 15:15.
8. Abrasions on both shoulders from carrying a rough heavy object.
9. Puncture wounds from sharp objects that pierced his scalp.
10. Pollen on the Shroud unique to the area around Jerusalem. Pollen from a plant with long thorns found around his head.
11. The images are negative images and contain 3D information that indicates the distance of the cloth from the body. Only the top 1 or 2 layers of fibers in a thread are discolored. The discolored fibers in the image result from the carbon atoms that were already in the cellulose molecules in the flax fibers being changed from single to double electron bonds, yet this produced the image of a naked crucified man.
12. Swollen cheeks and damaged nose from a beating or a fall.
13. Side wound shows a hole the size of a Roman thrusting spear.
14. Blood running down arms at the correct angles for crucifixion. Blood is real human blood, male, type AB. The blood with high bilirubin content and nanoparticles of creatinine bound to ferritin indicate he was severely tortured. Blood from the side wound is post-mortem.
15. Paintings from the Middle Ages show nails through the palms, but this will not support enough weight since there is no bone structure above this location. The Shroud shows the correct nail locations - through the wrist instead of the palm.
16. Shroud correctly shows thumbs folded under due to contact of the nail with the main nerve that goes through the wrist. This is also contrary to paintings from the Middle Ages.
17. Abrasions on one knee show a microscopic amount of dirt.
18. Three-inch wide side strip sown on with a unique stitch very similar to that found at Masada, which was destroyed in 73-74 AD.
19. Microscopic chips near the feet of travertine aragonite limestone containing impurities that closely match limestone in Jerusalem.

History of the Shroud of Turin

by Robert A. Rucker, Nov. 15, 2018, <http://www.shroudresearch.net/research.html>

According to research on documents, traditions, coins, artistic works, pollen, and DNA the following is the most likely history for Jesus' burial cloth (Ref. 1 to 3). Jesus' linen burial shroud was found by Peter and John in the tomb after Jesus' crucifixion in Jerusalem (John 20:3-9). Because it was one of the few things left behind by Jesus and because it had Jesus' blood on it, it is very unlikely to have been ignored, reused, burnt or thrown out. Due to its importance, it probably would have been protected from moisture, insects, and intentional destruction. Under these conditions, the linen shroud would only decay by oxidation and dehydration, so it could easily survive for thousands of years.

Galatians 3:1 (~ 47 to 56 AD) indicates that the believers in Galatia had been shown something that "clearly" or "publicly portrayed" "Jesus Christ ... as crucified" (NIV & NASB). The Greek word translated "portrayed" in this verse, "prographa", is one of the sources of our English word "graphic" and can be translated as "signboard" (NLT) or "placard" (Wuest). Based on the meaning of this Greek word and the context in the sentence, this was a physical object that contained an image of Jesus that showed that he was crucified. They had seen it with their "very eyes" (NIV). The most obvious explanation is that they saw Jesus' burial Shroud containing his image, as on the Shroud of Turin.

Many of the early believers, when they fled Jerusalem to avoid persecution, went to Antioch (Acts 11:19) so that it became the center for Christian outreach (Acts 11:26, 13:1). A tradition preserved in the writings of Athanasius (298–373 A.D.) indicates that prior to the destruction of Jerusalem in 70 AD, Christian relics, including the icon of our Lord, were brought from Jerusalem through Pella to Syria, perhaps Antioch. Ancient texts and an inscription indicate that Jesus' shroud may have been involved in the conversion of King Abgar the Great of Edessa in Mesopotamia probably in the second century.

The image that is now on the Shroud of Turin was frequently copied in Byzantine art, the earliest surviving example being the Christ Pantocrator painting from St. Catherine's Monastery at Sinai, which probably dates to about 550 AD. The Shroud was most likely brought to Constantinople, the capital of the Byzantine Empire, in 574 as the Image of God Incarnate. An alternate theory is that it was brought to Constantinople in 944 as the Mandylion or Image of Edessa. Its presence in Constantinople long before the C¹⁴ date of 1260 to 1390 AD is confirmed by Byzantine coins starting in 692, the Hungarian Pray Manuscript (1192-1195 AD), and the report (1203-1204 AD) of French crusader Robert de Clari that it was exhibited weekly at the Church of St. Mary in the Blachernae district of Constantinople. It may have been sold by Byzantine emperor Baldwin II to his cousin, King Louis IX of France, between 1237 and 1261. Others believe it may have been stolen from Constantinople in the sack of the city in 1204. In about 1355 it was exhibited in Lirey, France, as the true burial cloth of Jesus by the French knight Geoffrey de Charny, the grandson of Jean de Joinville, a principle adviser to King Louis IX. In 1453, it was sold by Geoffrey de Charny's granddaughter to Louis, the Duke of Savoy. It was then gradually transported across France till it came into Turin, Italy, in 1578. This historical evidence, when combined with the results of the scientific investigation of the Shroud, is sufficient to convince most Shroud researchers that the Shroud of Turin is very likely the authentic burial cloth of Jesus. No other alternative satisfies all the historical and scientific evidence.

1. Jack Markwardt, multiple papers on the Conference-2017 page of www.shroudresearch.net.
2. John Jackson, "The Shroud of Turin, A Critical Summary of Observations, Data, and Hypotheses".
3. Ian Wilson, "The Blood and the Shroud", 1998, The Free Press, ISBN 0-684-85359-0.

Image Formation on the Shroud of Turin

by Robert A. Rucker, Nov. 15, 2018, <http://www.shroudresearch.net/research.html>

How were the front and back images of a crucified man encoded onto the Shroud? The main objective of the Shroud of Turin Research Project (STuRP) was to study this question. In 1978, they sent about 26 researchers from the US to Turin, Italy, to perform hands-on non-destructive testing of the Shroud for five days, 24 hours a day. Their experiments determined that the image on the Shroud contains no pigment, no carrier, no brush strokes, no clumping of anything between the fibers or threads, no capillarity (soaking up of a liquid), and no cracking of the image along the fold lines. Many or all these would be present if the image were due to paint, dye, or stain, yet none of them are present. Their experiments also proved that the image on the Shroud is not due to a liquid, a scorch, a photographic process, or any other process that the researchers could think of.

Subsequent analysis by STURP proved that the straw-yellow discoloration that forms the image is only on the top one or two fiber layers in a thread. The discoloration on a fiber is about 0.2 microns thick around the outer circumference of the 15 to 20-micron diameter of a fiber. The discoloration is caused by a rearrangement of the electron bonding of the carbon atoms that were already in the cellulose molecules that make up the flax fibers in the linen Shroud. Thus, the discoloration is due to energy added to the cloth but without material/atoms being added to the cloth. The energy added to the cloth must have been added in one or more very short duration bursts of radiation so that the electron bonding could be altered before the energy dissipated beyond the top one or two layers of fibers in a thread.

Based on these unique characteristics, most Shroud researchers conclude that the image on the cloth could not have been made by any artist or forger in any previous era. The only other option is that the Shroud wrapped a real body of a man who died by crucifixion, and that this body in some unknown way created the image. But the mechanism that discolored the fibers on the Shroud must have required energy to drive it and information to control it. The required information is that which defines the appearance of a crucified man, which would have only been inherent to the body that was wrapped in the Shroud. Of the six processes that can transfer information from one location to another (radiation such as light, waves in a medium such as sound waves, a flow of particles in physical connections such as wires, direct contact, diffusion of molecules, and pulses in a gravitational or electrostatic field) only radiation could have transferred the focused information from the body to the cloth. This focused information is required to form the high-resolution images on the Shroud. We can see the image because this information has been encoded into the pattern of discolored fibers that make the image. Experiments have shown that ultraviolet (UV) and protons can form the type of fiber discoloration.

If we follow the evidence where it leads, without assuming we are limited to our current understanding of the laws of physics, we conclude that the image was formed by radiation damage to the molecules that compose the linen. The radiation carried the energy and information from the body to the cloth which was necessary to form the image. This radiation occurred in one or more very short powerful bursts that were emitted from within the body as it was wrapped within the Shroud, since bones (teeth, bones in the hands, etc.) can be seen in the image. The presence of the front and back images without side images indicates that the radiation was probably vertically collimated both up and down. (Ref. 1).

1. Robert A. Rucker, "Information Content on the Shroud of Turin", "The Role of Radiation in Image Formation on the Shroud of Turin", "Summary of Scientific Research on the Shroud of Turin", and "Explaining the Mysteries of the Shroud", all available on [shroudresearch.net/research.html](http://www.shroudresearch.net/research.html) .

Carbon Dating of the Shroud of Turin

by Robert A. Rucker, Nov. 19, 2018, <http://www.shroudresearch.net/research.html>

Results of the Shroud of Turin Research Project (STuRP) in 1978 strongly supported the authenticity of the linen Shroud, but in 1988 samples were cut from the lower corner of the cloth and sent for C^{14} dating at three laboratories in Tucson, Zurich, and Oxford. The average date from the three laboratories (Ref. 1) was 1260 ± 31 AD, which produced a range of 1260 to 1390 AD when corrected for the variable amount of C^{14} in the atmosphere. But subsequent statistical analysis (Ref. 2) of the data published in Ref. 1 found strong evidence that the variation in the laboratory's 16 measurements was not only due to random effects but probably also due to something that altered the measured dates from the first century to the Middle Ages. In statistical analysis terminology, this "something" is called a systematic bias. Since this bias was not recognized or corrected for, the conclusion in Ref. 1 that the Shroud dates to 1260 to 1390 AD should be rejected. The evidence can be summarized as follows:

- Due to its unique characteristics, the image could not have been made between 1260 and 1390 AD because the technology did not exist. The technology to form this image still does not exist.
- 13 other date indicators are consistent with a first century date for the Shroud and inconsistent with the C^{14} date of 1260 to 1390 AD including the Hungarian Pray Manuscript, the image of the face on paintings as early as about 550 AD and on coins as early as 675 AD, use of a first-century stitch on the Shroud, reflectance and tensile strength of linen as it ages, etc.
- The average dates from the laboratories in Tucson (1303.5 ± 17.2) and Oxford (1200.8 ± 30.7) are statistically different (difference = 102.7 ± 35.2) from each other at the $102.7 / 35.2 = 2.9$ sigma level, which is above the normal 2.0 sigma acceptance level.
- Plotting the average values from the three laboratories indicates there is a gradient or slope to the C^{14} date of about 36 years per cm of distance from the bottom of the Shroud. This indicates the presence of something that altered the measurements that depended on the sample location. Nuclear analysis computer calculations indicate that the slope in the C^{14} date of 36 years per cm can be explained by the distribution of neutrons in the tomb when emitted from within the body.
- When a Chi-squared statistical analysis is performed on all the measurements and uncertainties, the C^{14} date measurements have only a 1.4% probability of being consistent with the uncertainties. This indicates a 98% probability that something had altered the measurements. This something, or bias, changed the measurements by about 36 years per cm as stated above.
- The date in Ref. 1 (1260-1390 AD) was based on ignoring half the data, i.e. all measurement uncertainties. It is not legitimate to simply ignore all the measurement uncertainties: 1) they were obtained using the same equipment and procedures as the measurements, 2) they were reasonably consistent for all laboratories, and 3) they were reasonably consistent with the uncertainties for the three standards that were run at the same time.

What altered the measured dates? Evidence indicates that the image was formed by a burst of radiation emitted from within the body (Ref. 2). If neutrons were included in this burst of radiation, a small fraction of them would have been absorbed in N^{14} in the Shroud to add new C^{14} . To shift the C^{14} date from 30 AD to 1260 AD requires only a 16% increase in the C^{14} on the Shroud at the sample location.

1. P. E. Damon, et al, "Radiocarbon Dating of the Shroud of Turin", Nature, February 16, 1989.
2. Robert A. Rucker, "The Carbon Dating Problem for the Shroud of Turin, Part 1: Background", "Part 2: Statistical Analysis", and "Part 3: The Neutron Absorption Hypothesis", July 7, 2018.

Is it the Image of Jesus?

by Robert A. Rucker, Nov. 15, 2018, <http://www.shroudresearch.net/research.html>

Experiments conducted on the Shroud by the Shroud of Turin Research Project (STuRP) in 1978 indicate that the characteristics of the image are so unique that it could not have been made by an artist or a forger. The only other option is that the image was made in some unknown way by the body that was wrapped within the Shroud. But who's image is it? Could it be the image of Jesus? In a court of law, there are two general ways to prove the identity of a person – by eye-witness testimony based on how the person looks, and by circumstantial or physical evidence such as DNA, fingerprints, shoe prints, pollen, fibers, etc. Consider application of these identification methods to the image on the Shroud.

When you look at the images on the Shroud, you see good resolution front and back images of a crucified man: a nail wound in the wrist, blood running down the arms, and nail wounds in the feet. Additional aspects relate to how Jesus was specifically crucified: a severe flogging, a crown of thorns and a wound in the side with blood running down, and legs not broken. The image also indicates that he was dead: the curvature of the feet due to rigor mortis, and blood from the side wound indicating that the wound was post mortem, i.e. after death. Closer examination indicates swollen cheeks from a beating to the head, damaged nose from this beating or a fall, abrasions on both shoulders from carrying a rough heavy object, a section of his beard missing, and no body-decay products present. And the face on the Shroud agrees with our belief of what Jesus looked like. This is because our belief is based on the earliest paintings of Jesus (~ 550 AD) which were based on the image of the face on the Shroud.

Circumstantial evidence based on microscopic examination is also consistent with it being Jesus: dirt was found in abrasions on the tip of his nose and on one knee consistent with a fall, there was pollen from Jerusalem on the Shroud and around his head from a plant with long thorns, and there were small chips of limestone near the feet containing impurities that match limestone in Jerusalem. Chemical analysis indicates that what appears to be blood is real human blood and that it contains bilirubin, which would be present due to torture such as a severe flogging. All evidence points to the image being Jesus.

No human body, alive or dead, has ever produced a recognizable image of itself on fabric. The only exception is the Shroud with its image of a crucified man. Two criteria indicate the identity of this man.

- Based on the nature of the blood on the Shroud, the blood must have come from a real human body that was wrapped within the Shroud. Based on the image on the Shroud, the body that was wrapped within the Shroud was the dead body of a man that had been crucified.
- Based on the STuRP analysis, the image on the Shroud is not due to paint, dye, stain, liquid, scorch, or a photographic process. Evidence (Ref. 1) indicates that the image is due to radiation damage to the linen cloth caused by a burst of radiation that was emitted from within the body that was wrapped within the Shroud. We have no other example of this happening. It was evidently unique.

Thus, the question is, what man who died by crucifixion could have gone through a unique event in which his dead body emitted such a powerful burst of radiation that it burned an image of itself onto the linen cloth in which it was wrapped? If one looks through all mankind's historical records, only Jesus and his reported disappearance from within his burial shroud satisfy these two criteria. There is no other reasonable option. Thus, it should be concluded that the image on the Shroud of Turin is Jesus.

1. Robert A. Rucker, "Information Content on the Shroud of Turin", "The Role of Radiation in Image Formation on the Shroud of Turin", "Summary of Scientific Research on the Shroud of Turin", and "Explaining the Mysteries of the Shroud", all available on shroudresearch.net/research.html .

Research on the Shroud of Turin

- Books by Mark Antonacci:** 2. "Test the Shroud", 2015, 502 pages, available at www.testtheshroud.org
1. "The Resurrection of the Shroud", 2000, 328 pages

Papers by Mark Antonacci available on the ARTICLES page of www.testtheshroud.org

- "An Unrealistic Approach and Analysis of the Blood Flows on the Shroud of Turin"
"Production of Radiocarbon by Neutron Radiation on Linen" by A. Lind, Mark Antonacci, et al
"Nuclear Science and the Shroud of Turin"
"Particle Radiation from the Body Could Explain the Shroud's Images and its Carbon Dating"
"Scientists and Secmantics"

Papers by Robert A. Rucker available on the RESEARCH page of www.shroudresearch.net

Summary Papers

- Paper 18 "One Page Summary Papers", November 14, 2018
Paper 16 "Explaining the Mysteries of the Shroud", July 7, 2018
Paper 15 "Summary of Scientific Research on the Shroud of Turin", July 7, 2018

The Carbon Dating Problem

- Paper 13 "The Carbon Dating Problem for the Shroud of Turin, Part 3: The Neutron Absorption Hypothesis", July 7, 2018
Paper 12 "The Carbon Dating Problem for the Shroud of Turin, Part 3: Statistical Analysis", July 7, 2018
Paper 11 "The Carbon Dating Problem for the Shroud of Turin, Part 1: Background", July 7, 2018
Paper 10 "Proposal for C¹⁴ Dating of Charred Material Removed from the Shroud", April 29, 2018
Paper 8 "MCNP Analysis of Neutrons Released from Jesus' Body in the Resurrection", October 12, 2016

Image Formation on the Shroud

- Paper 14 "Potential Problems with a Cloth Collapse Hypothesis for Image Formation on the Shroud of Turin", July 7, 2018
Paper 6 "Role of Radiation in Image Formation on the Shroud of Turin", October 11, 2016
Paper 5 "Information Content on the Shroud of Turin", October 11, 2016

Other Aspects of Shroud Science

- Paper 9 "Ideas for Research on the Shroud of Turin", November 10, 2016

Evaluation of Items Written by Others

- Paper 17 "Evaluation of 'A BPA Approach to the Shroud of Turin'", September 27, 2018
Paper 4 "Review of 'Test the Shroud' by Mark Antonacci", October 11, 2016
Paper 3 "Review of 'The Shroud of Turin: Radiation Effects, Aging, and Image Formation' by Ray Robers", October 11, 2016, by Robert A. Rucker, Giulio Fanti, Mark Antonacci, Tony Fleming, and Keith Propp

Miscellaneous

- Paper 7 "Mr. Dotman in Lineland", October 6, 2016
Paper 2 "The Disappearance of Jesus' Body, Part 2: Physical Considerations", October 11, 2016
Paper 1 "The Disappearance of Jesus' Body, Part 1: Biblical and Theological Considerations", October 8, 2016