Is the Shroud of Turin Authentic?

By Fr. Andrew Dalton, LC, STD

Is the Shroud authentic? Is it the actual burial cloth that wrapped the dead body of Jesus of Nazareth on Good Friday and which lay empty in the tomb after his glorious Resurrection? Is it a relic in the deepest, ontological sense? These are three ways of asking the same question.

It is also the hardest of the three questions posed in our companion article, Is the Shroud of Turin a Catholic Relic? — where we established that the Shroud is unambiguously Catholic by custody, veneration, and institutional history, and that it qualifies as a relic in the devotional sense. The present question belongs to a different domain entirely: not faith, not institutional history, but the joint testimony of science and historical reasoning.

The Magisterium and Its Proper Scope

The Catholic Church's *Magisterium* — its formal teaching authority — pronounces upon matters of faith and morals: for example, the bodily Resurrection of Jesus, the Real Presence in the Eucharist, the inspiration and inerrancy of Scripture. These are dogmas, binding upon the faithful, requiring authoritative definition precisely because they are revealed truths that transcend empirical investigation.

The historical authenticity of the Shroud is not such a dogma — nor should it be. It belongs to the domain of history, archaeology, and empirical science. The Church has never formally declared the Shroud to be the burial cloth of Jesus Christ, for the same reason she has never formally declared that the bones beneath St. Peter's Basilica belong to the Apostle Peter, or that the Veil of Veronica — venerated for centuries in the same basilica as bearing the true image of Christ's face — is what tradition claims it to be. Such declarations lie outside the Magisterium's proper scope. Magisterial silence on a question of this kind is not agnosticism. It is appropriate institutional restraint before questions that science and history are better equipped to resolve.

This restraint should not be mistaken for indifference. Pope St. John Paul II, speaking before the Shroud in Turin on May 24, 1998, expressed the Church's posture with characteristic precision:

> *"The Shroud is a challenge to our intelligence. It first of all requires of every person, particularly the researcher, that he humbly grasp the profound message it sends to his reason and his life. The mysterious fascination of the Shroud forces questions to be raised about the sacred Linen and the historical life of Jesus. Since it is not a matter of faith, the Church has no specific competence to pronounce on these questions.*

She entrusts to scientists the task of continuing to investigate, so that satisfactory answers may be found to the questions connected with this Sheet, which, according to tradition, wrapped the body of our Redeemer after he had been taken down from the cross. The Church urges that the Shroud be studied without pre-established positions that take for granted results that are not such; she invites them to act with interior freedom and attentive respect for both scientific methodology and the sensibilities of believers."

The question of authenticity belongs to a domain with its own methods, and those methods should be brought to bear on it honestly, without prejudice — and without the prior determination, in either direction, that the result is already known.

An Honest Investigation

What, then, does an honest investigation show?

A standard move, at this point, is to highlight studies pointing to a first-century date. But these studies have not resulted in a scholarly consensus. A more rigorous approach begins not with the most favorable evidence but with what is most securely established. The method is called abductive reasoning, or inference to the best explanation — a method that stands in the tradition of convergence reasoning exemplified by Yves Delage's landmark 1902 presentation to the French Academy of Sciences. Rather than asserting conclusions, we ask: given a set of observations that both proponents and critics of authenticity acknowledge, what is the best explanation that makes sense of all of them together?

The following ten observations meet that standard. By "securely established" I do not mean claims immune to all scholarly challenge — no empirical claim enjoys that luxury. I mean claims confirmed by independent researchers across multiple scientific disciplines, acknowledged even by researchers skeptical of authenticity, and sufficiently robust that dismissing them would require dismissing the methodologies that produced them. The consilience they form is not the result of cherry-picking favorable data; it is the joint testimony of chemistry, physics, pathology, forensic science, and allied fields, working independently and arriving at the same place.

1. The image depicts a man's body with anatomical accuracy in both morphology and pathology fully consistent with Roman crucifixion as practiced in the first century — including scourge marks, a crown of thorns, wrist and foot wounds, and a post-mortem lance wound producing flows of blood and serum distinguishable by composition.
2. The bloodstained areas have been confirmed by more than ten independent analytical methods to contain genuine blood components: heme-derived porphyrins, hemoglobin breakdown products, albumin, and immunoglobulin. Serum halos visible under UV fluorescence indicate active coagulation from real wounds, not paint or dye. More recently, peer-reviewed research has identified creatinine-ferritin

nanoparticles at the atomic level — biological markers of severe polytrauma — providing additional evidence against any artificially applied medium.

3. The bloodstains preceded the body image: the image is absent beneath them, establishing that the body was wrapped in the cloth before the image formed.
4. The cloth shows no signs of decomposition or putrefaction. Moreover, the body image preserves indicators of rigor mortis that had not yet resolved: the chin is drawn toward the sternum, the knees remain slightly flexed, and the gluteal muscles appear contracted rather than flattened. These features establish that the body departed the cloth within approximately 40 hours of death — and did so without disturbing the dried bloodstains adhering to the skin, which is forensically inconsistent with any known method of manual removal.
5. The image functions as a photonegative — light and dark values are reversed — yet was not recognized as such until Secondo Pia's accidental photographic discovery in 1898. A forger would have had to encode a negative image with no concept of photography and no means of verifying the result.
6. The image encodes three-dimensional spatial information: when processed by VP-8 image analysis software, it produces a geometrically accurate human relief. No painting, photograph, or other flat artwork does this.
7. The coloration is the result of an oxidation-dehydration of the cellulose molecules on the outermost surface of the linen fibrils — a chemical transformation of the cloth itself, not the addition of any foreign substance. Chemical analysis confirms no paint, dye, ink, or applied medium of any kind — nor any evidence of scorching, rubbing, or vapor contact. There are no brushstrokes, directionality, highlights, or shadows. The color gradient is produced not by varying pigment intensity but by the alternating density of colored and uncolored fibrils — the same fibril-level mechanism that encodes the three-dimensional information noted above. These findings were independently confirmed by the 33-scientist STURP team in 1981.
8. The coloration is confined to the outermost surface of the cloth to a depth of approximately 0.2 micrometers — one-fifth of a thousandth of a millimeter, roughly the thickness of a single fibril's primary cell wall. When the cloth is backlit, the body image disappears entirely, while bloodstains, fire scorches, and watermarks remain visible — confirming that the image is a surface phenomenon and not a substance added to or penetrating the linen.
9. The 1988 radiocarbon dating result of 1260–1390 AD has been shown by subsequent peer-reviewed analysis to be unreliable. Raymond Rogers (*Thermochimica Acta*, 2005) demonstrated chemically that the sampled corner is not representative of the cloth as a whole. Casabianca et al. (*Archaeometry*, 2019), working from raw data released under legal compulsion in 2017, demonstrated significant discrepancies between the raw laboratory values and those published in *Nature* in 1989, and showed that the data fail standard homogeneity tests — leading to the peer-reviewed conclusion that the 1988 result does not meet current methodological accuracy requirements.

10. The only experimental technique achieving the chemical and physical characteristics of the image at the microscopic level is deep ultraviolet laser irradiation. Paolo Di Lazzaro and his team (*Applied Optics*, 2012) achieved a superficial, Shroud-like coloration of linen using ArF excimer laser pulses at 193 nanometers — but only within an extraordinarily narrow range of irradiation parameters, and only over small surface areas. Extrapolating to the full surface area of a human body, Di Lazzaro estimated that doing so would require approximately 34 trillion watts of energy delivered in a pulse of approximately 25 nanoseconds — one forty-billionth of a second — and concluded that this lies beyond current technology.

What the Evidence Points Toward

Taken together, these observations form what philosophers of science call a *consilience of inductions* — a convergence of independent lines of evidence pointing toward the same conclusion. Though no single datum is decisive, the cumulative case is formidable.

That cumulative case converges, in the first instance, on a single result: the image is not the natural effect of any natural cause we know. But what if it is the natural effect of a supernatural event? What cadaver leaves bloodstains and an anatomically accurate body image that functions as a photonegative, encodes three-dimensionality, sits only on the surface of the fibers — and whose only known physical analogue is a burst of light requiring 34 trillion watts delivered in one forty-billionth of a second?

This is not the argument from ignorance that critics of intelligent design have rightly resisted — not a gap in current knowledge awaiting a future solution. It is a positive argument from specific, bounded, and repeatedly confirmed characteristics, none of which admit a naturalistic mechanism. The consilience does not merely leave nature unexplained. It points beyond it.

We are not, however, reasoning in a vacuum. We happen to possess independent historical testimony about precisely the kind of event the evidence requires: the bodily Resurrection of Jesus of Nazareth, attested by the earliest Christian witnesses — all four of whom note the burial cloths — and transmitted through the Church's continuous proclamation. The Resurrection — understood not as resuscitation but as the transformation of a mortal body into a glorified, incorruptible state — is the only proposed event that accounts for all ten observations simultaneously: image formation without contact medium, superficiality of coloration, three-dimensional encoding, absence of decomposition, and the cloth’s having been vacated without disturbing the bloodstains.

If the Resurrection is the best explanation for the production of the image, then the cloth that bears that image is what it has always been claimed to be. Authenticity is not a premise of the argument. It is its conclusion.

It does not compel assent — no abductive argument does, however robust the consilience. Unlike a mathematical proof or a valid syllogism, inference to the best explanation yields

conclusions that are probable, not necessary. To paraphrase Pascal: there is enough light for those who wish to see, and enough obscurity for those who decide not to.

Conclusion

Is the Shroud of Turin authentic?

The Magisterium has not answered this question dogmatically, because dogma is not the right instrument for a historical and empirical inquiry. The cumulative scientific and historical evidence, however, gives every serious investigator compelling reason to affirm it.

In the end, the Shroud does not impose itself — like Jesus himself, it invites: “Come and see” (John 1:39).

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Further Reading

Barbet, Pierre. *A Doctor at Calvary: The Passion of Our Lord Jesus Christ as Described by a Surgeon*. Image Books, 1963. The foundational medical analysis of the wounds visible on the Shroud, written by a French surgeon. Essential reading for the pathology of crucifixion.

Casabianca, Tristan, et al. "Radiocarbon Dating of the Turin Shroud: New Evidence from Raw Data." *Archaeometry* 61, no. 5 (2019): 1223–1231. Demonstrates, from raw laboratory data released under legal compulsion, that the 1988 dating result fails standard homogeneity tests and does not meet current methodological accuracy requirements.

Casabianca, Tristan. "Systematic Evaluation of Recent Research on the Shroud of Turin." *Theology and Science* 23, no. 1 (2025): 72–88. The most current scholarly map of the field, surveying recent developments in dating, image formation, and blood analysis. The best single starting point for readers who want to know where the research stands today.

Delage, Yves. "Le Linceul de Turin: lettre à M. Charles Richet." *Revue Scientifique*, 4e série, XVII/1 (1902): 683–687. The landmark presentation by a French agnostic zoologist and member of the French Academy of Sciences, arguing on purely empirical grounds that the Man of the Shroud is Jesus of Nazareth with a probability of one in ten billion. A historic document in the convergence tradition of Shroud reasoning.

Di Lazzaro, Paolo, et al. "Superficial and Shroud-Like Coloration of Linen by Short Laser Pulses in the Vacuum Ultraviolet." *Applied Optics* 51, no. 36 (2012): 8567–8578. The definitive experimental study establishing that deep ultraviolet laser irradiation is the only known technique capable of producing colorations physically and chemically analogous to the Shroud image — and quantifying the energy parameters required.

Di Lazzaro, Paolo, Anthony C. Atkinson, Paola Iacomussi, Marco Riani, Marco Ricci, and Peter Wadhams. "Statistical and Proactive Analysis of an Inter-Laboratory Comparison: The Radiocarbon Dating of the Shroud of Turin." *Entropy* 22, no. 9 (2020): 926. A multi-disciplinary reanalysis of the 1988 radiocarbon dating by physicists and statisticians, assessing the error introduced by the non-standard sampling procedure and confirming the unreliability of the 1260–1390 AD result on independent methodological grounds.

Di Lazzaro, Paolo, and Daniele Murra. "A Scientist's Perspective on the Intertwining of Science, Faith, Free Will, and the Message of the Shroud of Turin." *Scientia et Fides* 14, no. 1 (2026): 171–188. Open access. Di Lazzaro's most recent treatment of the Shroud, moving beyond the experimental results for which he is best known to argue that the cloth offers a distinctive case study in the relationship between science, faith, and free will — and that its significance cannot be reduced to the question of authenticity alone.

Edwards, William D., Wesley J. Gabel, and Floyd E. Hosmer. "On the Physical Death of Jesus Christ." *JAMA* 255, no. 11 (1986): 1455–1463. A landmark article in the *Journal of the American Medical Association* by a Mayo Clinic pathologist and colleagues, providing a medically rigorous reconstruction of crucifixion physiology and the probable cause of Jesus' death, drawing extensively on the Shroud's wound evidence. The most accessible entry point for medically trained readers.

Heller, John H., and Alan D. Adler. "A Chemical Investigation of the Shroud of Turin." *Canadian Society of Forensic Science Journal* 14, no. 3 (1981): 81–103. The foundational STURP chemistry paper confirming the presence of genuine blood components and the absence of any applied artistic medium.

Jackson, John P., et al. "Correlation of Image Intensity on the Turin Shroud with the 3-D Structure of a Human Body Shape." *Applied Optics* 23, no. 14 (1984): 2244–2270. The key paper establishing the three-dimensional spatial encoding of the body image, based on VP-8 image analysis.

Jackson, John P., and the Turin Shroud Center of Colorado. *The Shroud of Turin: A Critical Summary of Observations, Data, and Hypotheses*. CMJ Marian Publishers, 2017. The most comprehensive single-volume synthesis of the scientific evidence, produced by the physicist who has devoted more research hours to the Shroud than any other living scholar. Essential for readers who want the full evidential picture in one place.

Jumper, Eric J., Alan D. Adler, John P. Jackson, Samuel Pellicori, John H. Heller, and James R. Druzik. "A Comprehensive Examination of the Various Stains and Images on the Shroud of Turin." ACS Advances in Chemistry 205 (1984): 447–476. The broadest single paper to emerge from the 1978 STURP examination, surveying all image and stain characteristics together. The natural complement to the Heller/Adler chemistry paper, and essential for readers who want the full scope of what the most intensive scientific examination of the Shroud established.

Riani, Marco, Anthony C. Atkinson, Giulio Fanti, and Fabio Crosilla. "Regression Analysis with Partially Labelled Regressors: Carbon Dating of the Shroud of Turin." Statistics and Computing 23, no. 4 (2013): 551–561. The statistical precursor to Casabianca et al. (2019), establishing through robust regression analysis that the 1988 radiocarbon results exhibit a significant spatial gradient across subsamples — evidence of heterogeneity incompatible with a uniform cloth sample.

Rogers, Raymond N. "Studies on the Radiocarbon Sample from the Shroud of Turin." *Thermochimica Acta* 425, nos. 1–2 (2005): 189–194. Chemical demonstration that the 1988 carbon-dating sample was taken from a medievally repaired section of the cloth and is therefore not representative of the original linen.

Thurston, Herbert. "Relics." In *The Catholic Encyclopedia*, vol. 12. Robert Appleton Company, 1911. Available online via New Advent. Dated but still the most concise reliable treatment of Catholic relic theology and canonical classification — directly relevant to the devotional/ontological distinction drawn in this article.

Walsh, Bryan, and Larry Schwalbe. "An Instructive Inter-Laboratory Comparison: The 1988 Radiocarbon Dating of the Shroud of Turin." Journal of Archaeological Science Reports 29 (2020): 102015. A rigorous statistical reanalysis of the 1988 data by researchers not associated with the authenticity case, confirming the inter-laboratory heterogeneity identified by Riani et al. (2013) and Casabianca et al. (2019). Its value lies precisely in its independence from apologetic interests.

White, Cheryl H. *The Shroud of Turin in the Third Millennium?: Confronting the Limits of Human Knowledge*. WestBow Press, 2025. A professor of history at Louisiana State University Shreveport approaches the Shroud not as an apologetic case but as an epistemological challenge — examining what the historical and scientific methods can and cannot establish, and where honest inquiry must acknowledge its limits. Recommended for readers interested in the philosophy of historical inquiry as much as in the Shroud itself.

Wilson, Ian. *The Shroud: The 2000-Year-Old Mystery Solved*. Bantam Press, 2010. The most comprehensive historical study of the Shroud's provenance, tracing its proposed journey from first-century Jerusalem through Edessa, Constantinople, and medieval France to Turin. The essential starting point for the historical question.