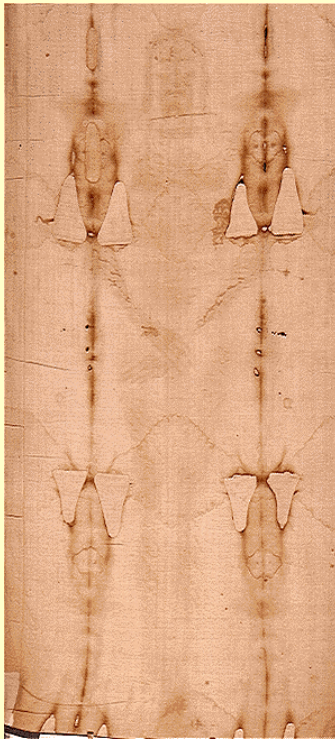


A Skeptic's View of the Shroud of Turin: History, Iconography, Photography, Blood, Pigment, and Pollen



by

Steven D. Schafersman

December, 2003

(Last updated: January, 2005)

Skeptical Shroud of Turin Site:

www.skeptic.ws/shroud/

Email: info@freeinquiry.com



Edward Hall (left), Michael Tite (centre) and Robert Hedges at the British Museum after revealing their findings on the shroud.

Turin Shroud shown to be a fake

By Michael Sheridan in Rome
and Phil Reeves in London

CARDINAL Anastasio Ballestrero of Turin yesterday confirmed what newspaper readers around the world have known for weeks: that tests on the Turin Shroud have shown it to be of medieval origin.

The shroud, believed by many to carry the imprint of Christ's face and body when laid in the tomb, has attracted devout pilgrims to Turin for centuries. Leaks of the results of modern carbon-dating tests had infuriated the archdiocese of Turin and the shroud's Italian custodians who spoke darkly of foreign plots against Italy, anti-Catholic prejudice and the like.

Yesterday it was at last official: the tests had established a 95 per cent likelihood that the 14-foot linen was made between 1260 and 1390 AD. There is no chance that it dates back to the time of Christ.

Cardinal Ballestrero pointed out that the church had never claimed that the shroud represented Jesus but had honoured a tradition of piety rooted in centuries past.

"Considering the results of the scientific tests, the church reiterates her respect and her veneration for the shroud," he said.

The tests were carried out in laboratories at Oxford University and in Arizona and Zurich. They were based on counting the number of radioactive carbon 14 atoms in a fragment of the shroud about the size of a postage stamp.

However, they did not resolve the icon's ori-



The Shroud of Turin: exposed as a fake.

gin, or the mystery which surrounds the blood-stained image on the shroud, resembling a photographic negative, of an apparently crucified man.

Professor Edward Hall, the director of the Oxford research laboratory involved, gave his theory: "There was a multi-million pound business in making forgeries during the four-

teenth century. Someone just got a bit of linen, faked it up, and flogged it."

Professor Hall, 64, who said he had a file full of mostly "cranky" letters from believers in the shroud's authenticity, added that some people would probably continue to regard it as genuine, "just as there is a Flat Earth Society". But he was utterly convinced his findings were right.

Modern Catholic teaching holds that relics are an aid to devotion. They divide into three classes: a first-class relic is either an instrument of the Passion, such as the Turin Shroud, or bones of the saints.

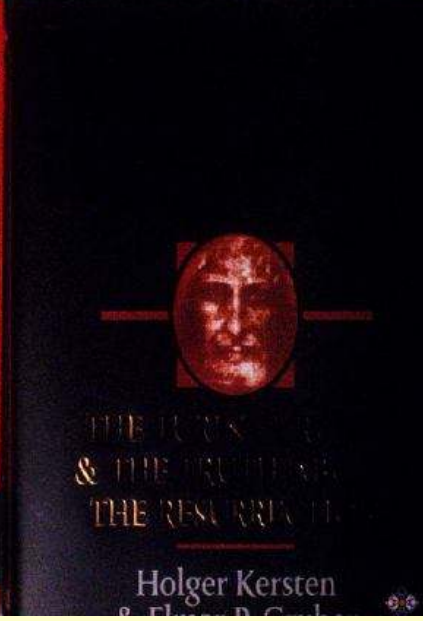
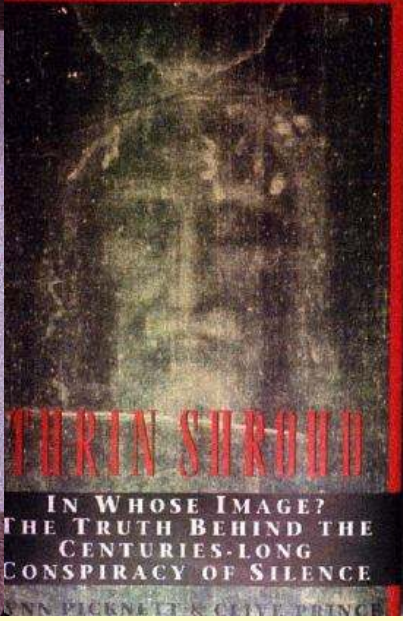
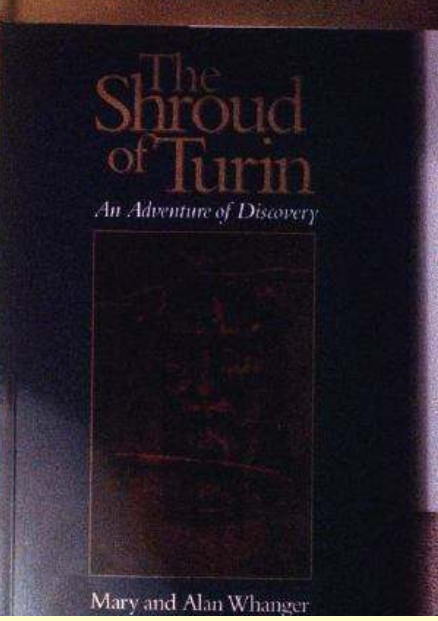
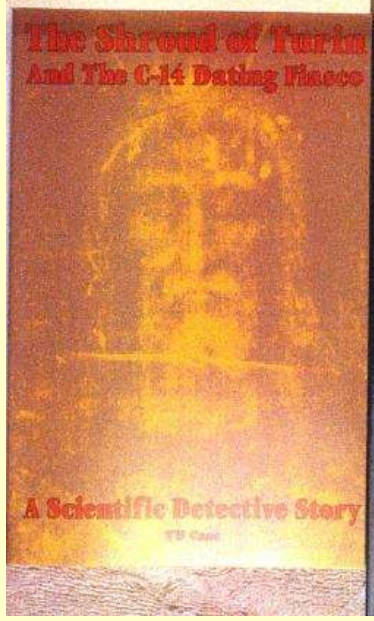
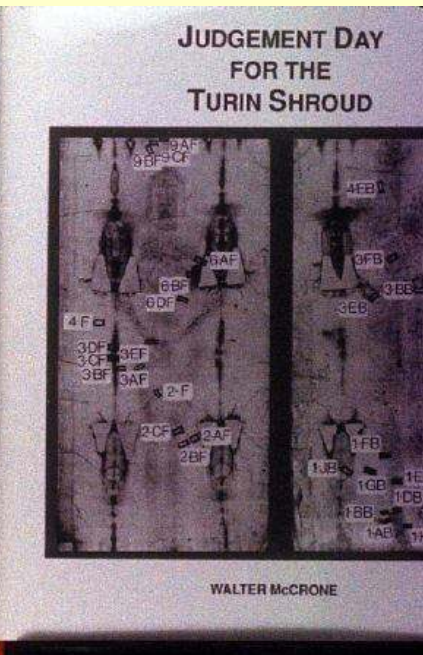
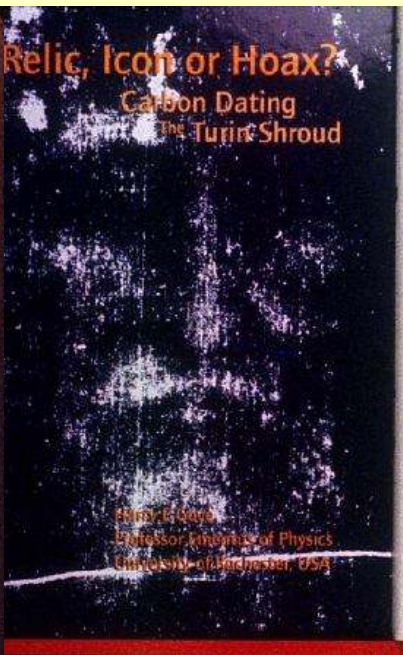
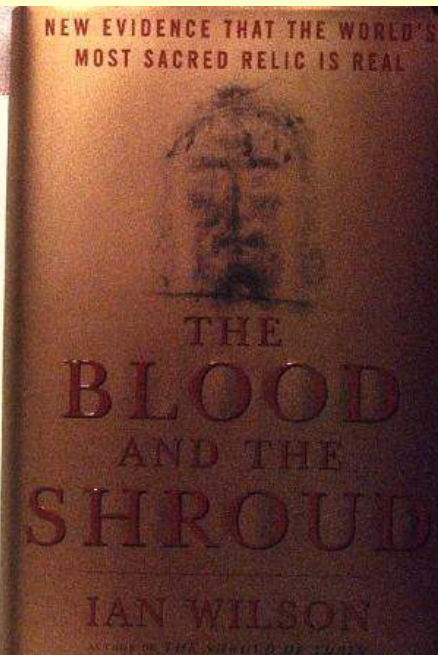
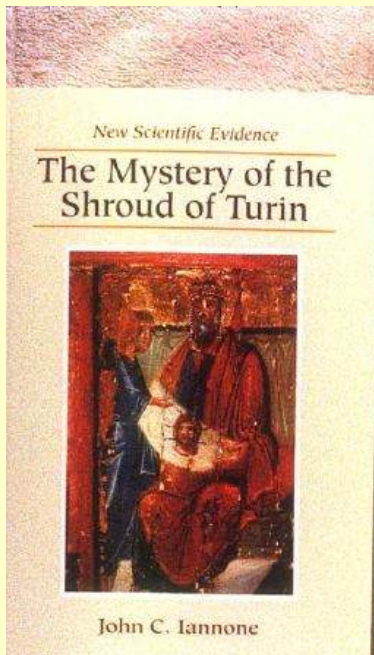
A second-class relic is an object which has touched one of these, and a third-class relic is an object which has touched a second-class relic.

The disappointment to believers in the shroud is unlikely to deter enthusiasts for the tens of thousands of relics, many of them the products of medieval tricksters, which repose in gilded cases and cushioned jewel-boxes in churches throughout Italy.

In Rome, one may view a feather from the Archangel Gabriel at the church of Santa Croce in Gerusalemme.

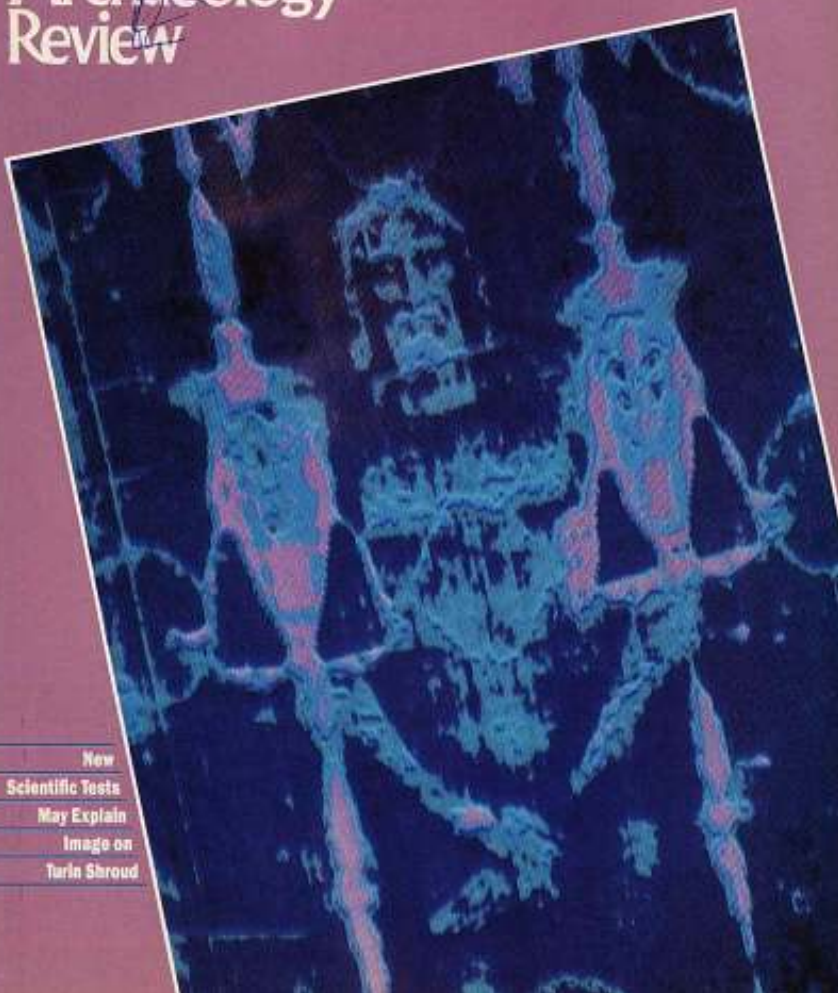
Other examples include vials containing the last breath of Saint Joseph, several heads of Saint John the Baptist, innumerable splinters from the True Cross, and two thorns from the crown.

In Naples, a vial containing the blood of Saint Januarius miraculously liquefies each year. In 1980, when it failed to do so, the city was struck by an earthquake.



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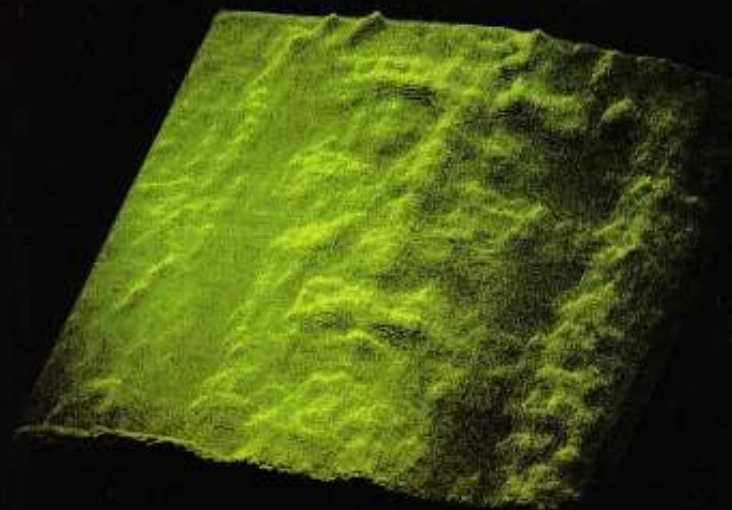


New
Scientific Tests
May Explain
Image on
Turin Shroud

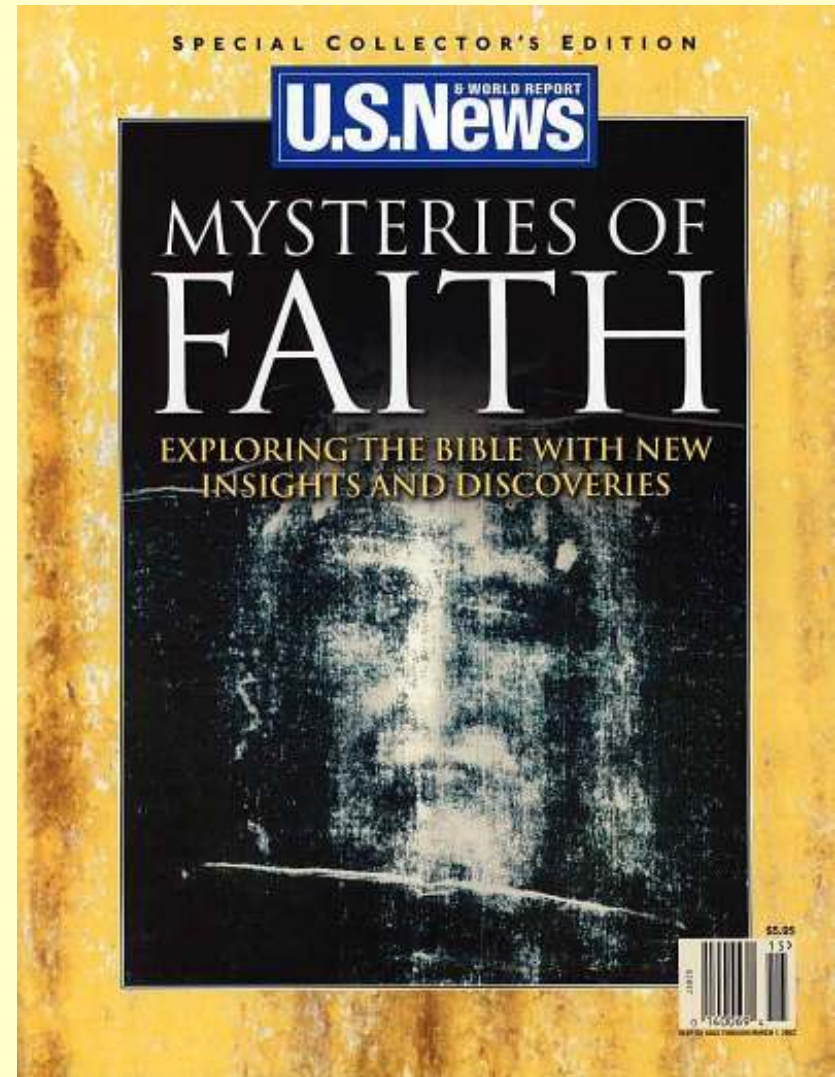
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10
Tenth Anniversary



THE SHROUD OF TURIN
not the shroud of Jesus







Skeptical Investigation of Pseudoscience and Claims of the Paranormal

Paranormalism

- Communication with the dead (channeling, spiritualism)
- Belief in ghosts, fairies, trolls, demons, and other entities
- Parapsychology: ESP, telekinesis, mental telepathy, clairvoyance
- UFOs as extraterrestrial space vehicles
- Alien abductions, crop circles, etc.
- Astrology
- Therapeutic touch, psychic surgery
- Bermuda Triangle

Pseudoscience

- Scientific Creationism
- Intelligent Design
- Catastrophism (Velikovsky, Impact Geology, Flood Geology)
- Bigfoot, Loch Ness Monster, and other cryptozoological subjects
- Cult Archaeology
- Racist Anthropology
- Perpetual Motion Machines
- Infinite Free Energy
- Alternative Medicine
- Authenticity of the Shroud of Turin

1. Paranormalism v. Pseudoscience

Pseudoscience is a type of paranormalism, but in certain ways it is among the worst.

- Paranormalists, for the most part, believe their paranormal claims for their own interests or entertainment, espousing no mendacity—only a significant lack of critical thinking. Sometimes paranormal beliefs are harmful to oneself or others, sometimes not, but certainly not necessarily so.
- Pseudoscientists, however, must believe in a false methodology to obtain knowledge and therefore must actively pervert the integrity and methods of science to promote their beliefs. This effort is harmful to all because it undermines the accepted procedures humans use to discover reliable knowledge.

2. Paranormalism v. Pseudoscience

Pseudoscience is a type of paranormalism, but in certain ways it is among the worst.

- Paranormalists are credulous and either deceived or self-deceived, and most often are true believers, but usually are not willfully stubborn, deceitful, or mendacious.
- Pseudoscientists are also credulous and self-deceived, but because good evidence always exists to refute their beliefs, they must actively resist acknowledging the veracity of the evidence, instead engage in distorting and misrepresenting the nature of the conflicting evidence when promoting their own fallacious evidence. This is credulity-mongering and nonsense-peddling, which I consider to be a greater epistemic and ethical lapse than the simple credulous, unskeptical beliefs of paranormalists. Pseudoscientists try to convince others of their claims and publicize them.

What Is Pseudoscience?

- Pseudoscience means “False Science,” an activity that doesn't play by the same rules as legitimate science.
- Pseudoscience promotes extraordinary claims about nature without possessing the corresponding and necessary extraordinary evidence that supports those claims.
- Indeed, pseudoscience usually ignores or rejects the reliable and convincing existing evidence that contradicts its claims.
- Pseudoscientists exploit the integrity and public trust of scientists by pretending to be scientists, thus undeservedly sharing the legitimacy and prestige real scientists possess. This is especially bad because pseudoscientists thereby confuse the public about the nature of true science.

1. What Do Pseudoscientists Do?

- Start with belief in the desired conclusion and create evidence to support it, even when the conclusion requires supernormal or supernatural action.
- Do not test the conclusion or, if tested, do not test it competently or thoroughly, even when the simplest tests are completely adequate to reveal the truth.
- Ignore evidence that refutes their conclusions or attempt to explain the evidence away using bizarre and specious arguments.
- Misrepresent or willfully misinterpret facts that are not consistent with the desired conclusion, and engaging in "over-reaching" and credulity-mongering to promote the conclusion.

2. What Do Pseudoscientists Do?

- Disparage those scientists who discover and publish the solid evidence that reveals that their desired pseudoscientific conclusions are false.
- Publish their “scientific” results and conclusions in unedited or poorly edited journals, usually with no or incompetent peer review. In this fashion, some legitimate popular technology and science journals have published pseudoscientific papers.
- Present frequent public lectures and symposia, and writing popular books and articles, to try to convince the public directly, rather than building one’s case through proper scientific channels.
- Fraudulently manufacture evidence to support their beliefs and publish such “evidence” in poorly edited journals, thus making it available for other honest but credulous scientists to use in subsequent studies.

What is Sindonology?

Sadly, we will find that *all* of these activities characterize Sindonology (or "Shroudology"), the pseudoscientific promotion of the authenticity of the Shroud of Turin.

The Shroud has indeed been the object of serious scientific study by many legitimate scientists, but these truly scientific studies have *not* claimed the Shroud is authentic, first-century C.E. in age, or is anything but an artifact. *Every truly scientific study conducted by legitimate scientists--and there have been several of these--has concluded that the Shroud of Turin is an early Fourteenth Century artifact created to deceive viewers by representing the crucified Jesus Christ.*

What do Sindonologists Claim?

The Shroud pseudoscientists, however, repeatedly make the following *false* claims about the Shroud in their books, articles, and websites:

1. "The tests show clearly that the Shroud images are not any kind of artistic production but are the result of physical/chemical changes in the linen fibers themselves. However, they fail to explain how this occurred." (Council for Study of the Shroud of Turin)

TRUTH: The Shroud is actually the product of a cunning and accomplished High Gothic artist; the images were created by the application of pigments to a linen cloth treated with a tempera binder.

2. "No pigments, paints, dyes or stains have been found on the fibrils. X-ray, fluorescence and microchemistry on the fibrils preclude the possibility of paint being used as a method for creating the image." (STURP Summary)

TRUTH: Red ochre, vermilion, and rose madder particles have been found on the pigments in the image and blood areas. These particles are absent in the non-image areas.

What do Sindonologists Claim?

3. "Computer image enhancement and analysis by a device known as a VP-8 image analyzer show that the image has unique, three-dimensional information encoded in it." (STURP Summary)

TRUTH: The three-dimensional appearance of the face is not unique, but is something that would be expected from pigment-applied image with particular tonal gradations, such as an image created by a bas-relief rubbing. *Any* image with the proper tonal gradations can be transformed into a 3-D image with an image analyzer.

4. "We can conclude for now that the Shroud image is that of a real human form of a scourged, crucified man. It is not the product of an artist." (STURP Summary)

TRUTH: The Shroud is without doubt the product of an artist, and the Shroud contains the image of a person *intended* to represent Jesus Christ, since it was artistically created to serve as a holy relic for veneration by pilgrims.

What do Sindonologists Claim?

5. "By spectroscopic and chemical tests (conversion of heme to a porphyrin), we have identified the presence of blood in the alleged blood areas of the Shroud of Turin." (John Heller and Alan Adler, 1980, p. 2742)

TRUTH: Heller and Adler's test in this paper was actually inconclusive, since all they did was prove the presence of a porphyrin, of which there are many in nature, including plants. In a subsequent paper, they were deceived by false positive reactions to the presence of iron and protein in the "blood" pigment and binder. Walter McCrone's specific tests for blood were all negative, as were the tests of earlier unbiased Italian investigators.

6. "The blood stains are composed of hemoglobin and also give a positive test for serum albumin." (STURP Summary)

TRUTH: There is no hemoglobin, serum albumin, or blood of any kind on the Shroud. The "blood" is composed primarily of vermilion and red ochre pigments. The proteins and albumin detected by STURP are from boiled parchment and possibly egg used in the tempera pigment binder.

What do Sindonologists Claim?

7. "It is clear that there has been a direct contact of the Shroud with a body, which explains certain features such as scourge marks, as well as the blood."
(STURP Summary)

TRUTH: The Shroud was either painted or, more likely, was once in direct contact with a bas-relief sculpture, carving, or cast. The image is too undistorted to be the result of *any* natural means of image transfer from a human body. The blood was artistically applied after the image was laid down on the linen cloth.

8. "There are no chemical or physical methods known which can account for the totality of the image, nor can any combination of physical, chemical, biological or medical circumstances explain the image adequately. Thus, the answer to the question of how the image was produced or what produced the image remains, now, as it has in the past, a mystery." (STURP Summary)

TRUTH: Skeptics have demonstrated that the Shroud could easily have been created by an artist using materials and techniques available in early Fourteenth Century France.

What do Sindonologists Claim?

9. "See the most recent report by Garza Valdes . . . concerning 'bio-plastic coating' he found on Shroud fibers, in sufficient quantity to throw the date WAY off. This organic material would of course be younger than the linen itself and would not have been removed in pretreatment." (William Meacham)

TRUTH: There is no "bio-plastic coating" on Shroud fibers, and what contaminants were present were removed in pretreatment before radiocarbon dating. If young contaminants were present on an authentic and ancient Shroud, they would have to be twice the mass of the linen to throw off the radiocarbon date sufficiently for it to reach the Fourteenth Century. Such extra mass would not escape notice by either scientists or cameras.

10. "The radiocarbon dates obtained in 1988 from the Shroud of Turin samples by the laboratories of the Universities of Arizona, Oxford, and Zurich, are a result of averaging of radiocarbon from the cellulose of the Shroud linen and radiocarbon from the [biological contaminants] deposited on the linen fibers." (Leoncio Garza-Valdes)

TRUTH: Biological contaminants were removed prior to radiocarbon dating, as is standard technique in such circumstances.

What do Sindonologists Claim?

11. "Our botanical evidence, together with additional physical data, suggests that the Shroud of Turin existed before the 8th century and that it originated from the vicinity of Jerusalem."

"The two plant species identified as part of the Shroud, beyond any reasonable doubt, are *Gundelia tournefortii* and *Zygophyllum dumosum*. Their presence on the Shroud, with the former confirmed by its pollen grains and both identified by presumed imaging, indicate the Shroud originated in the spring season (March-April) in the Jerusalem area."

"This pollen association . . . suggests the radiocarbon dating of the Shroud to only the Middle Ages as untenable." (Avinoam Danin, Alan Whanger, Uri Baruch, Mary Whanger, *Flora of the Shroud of Turin*, 1999, p. 1, 23, 24)

TRUTH: The Shroud was never in Jerusalem. The pollen of these plants were never on the Shroud, but are found on tape samples from the Shroud that were fraudulently prepared or manipulated by Max Frei. The "presumed imaging" of the plants is completely the product of the imagination of Alan Whanger, who sees images in water stains on the Shroud linen recognizable only to him—they are not truthfully visible. The fraudulent pollen data cast no doubt on the reliable radiocarbon dating; rather, the opposite is true!

What do Sindonologists Claim?

12. "I was looking at near proof positive [the pollen data] that the Shroud must have been in the land of Israel at some time in its history. It was evidence hugely supported of the cloth's authenticity, and thereby rendered as so much waste paper all the unworthy allegations against Dr. Max Frei." (Ian Wilson and Barrie Schwartz, *The Turin Shroud*, 2000, p. 88)

TRUTH: Max Frei spiked his tapes with Palestinian pollen of dozens of species he himself had collected and placed on the sticky tapes. The evidence for this is overwhelming and subsequent studies have only confirmed it.

13. "That Frei genuinely obtained hundreds of pollens with [his sticky tape] method is beyond doubt. . . . not only did there emerge on these much of the same detritus as on the STURP tapes, but also hundreds of pollens." (Ian Wilson, *The Blood and the Shroud*, 1998, p. 101)

TRUTH: Frei's sticky tape sampling method extracted the *same* fibers and other debris as did STURP, but with two additions: hundreds of pollen grains from Palestine and Turkey and cotton fibers from his gloves. Contrary to Wilson, STURP's sticky tapes were accurate and legitimate samples. The aberrant pollen of dozens of endemic species mixed with the cotton fibers prove that Max Frei had transferred pollen to the tape surface.

What do Sindonologists Claim?

14. "I received samples of both warp and weft threads that Prof. Luigi Gonella had taken from the radiocarbon sample before it was distributed for dating. Gonella reported that he excised the threads from the center of the radiocarbon sample." (Ray Rogers, *Studies on the radiocarbon sample from the Shroud of Turin*, 2005)

TRUTH: If Gonella's statement is true, then he seriously violated the protocols of sample removal and performed an irresponsible act. There is no official record of the removal or donation of these threads. Furthermore, to receive threads of this spurious sample at this late date suggests that the threads are suspect and not to be trusted as really being from the sample sent out for radiocarbon dating. Rogers' entire argument rests on his analysis of these two tiny threads (and the adjacent Raes sample threads he claims to possess).

15. Because "the Shroud and other very old linens do not give the vanillin test, the cloth must be very old," thus making it "very unlikely that the linen was produced during medieval times." (Ray Rogers, *Studies* *ibid.*, 2005)

TRUTH: Rogers' vanillin test is not a quantifiable or reliable method to determine the age of a linen thread sample. It is suggestive only, since--unlike radiocarbon dating--it is subject to many variables that cannot be controlled.

What do Sindonologists Claim?

16. "Pyrolysis-mass-spectrometry results from the sample area coupled with microscopic and microchemical observations prove that the radiocarbon sample was not part of the original cloth of the Shroud of Turin." (Ray Rogers, *Studies on the radiocarbon sample from the Shroud of Turin*, 2005)

TRUTH: The suggestion that the Shroud linen samples used for radiocarbon dating are from a much-younger patch is a fantasy held dear by pro-authenticity believers. Rogers' analysis and logic were faulty and do not prove that the samples are not part of the original Shroud. He relied on the speculations of others and inadequate methods and data to reach his apriori conclusions. The radiocarbon-dated samples were carefully studied and removed by experts to avoid contamination, and are unquestionably original.

17. "The presence of alizarin dye and red lakes in the Raes and radiocarbon samples indicates that the color has been manipulated . . . the coating implies that repairs were made at an unknown time with foreign linen dyed to match the older original material." (Ray Rogers, *Studies ibid.*, 2005)

TRUTH: Rogers never studied the radiocarbon samples. His threads from the Raes sample are indeed coated and stained, as is the entire Shroud from the artist's tempera protein binder. He apparently never subjected fibers from the main Shroud to his same tests to see if *they* were also stained and coated.

Plan of this Presentation

1. History and Iconography of the Shroud
2. Photographic Image of the Shroud
3. Three-Dimensional Aspect of the Shroud
4. Formation of the Shroud Images
5. Alleged “Blood” on the Shroud
6. Bioplastic Coating and the “DNA of God?”
7. Palestinian Pollen and Plants on the Shroud
8. Summary of Shroud Science and Pseudoscience

Where is the Shroud of Turin located?





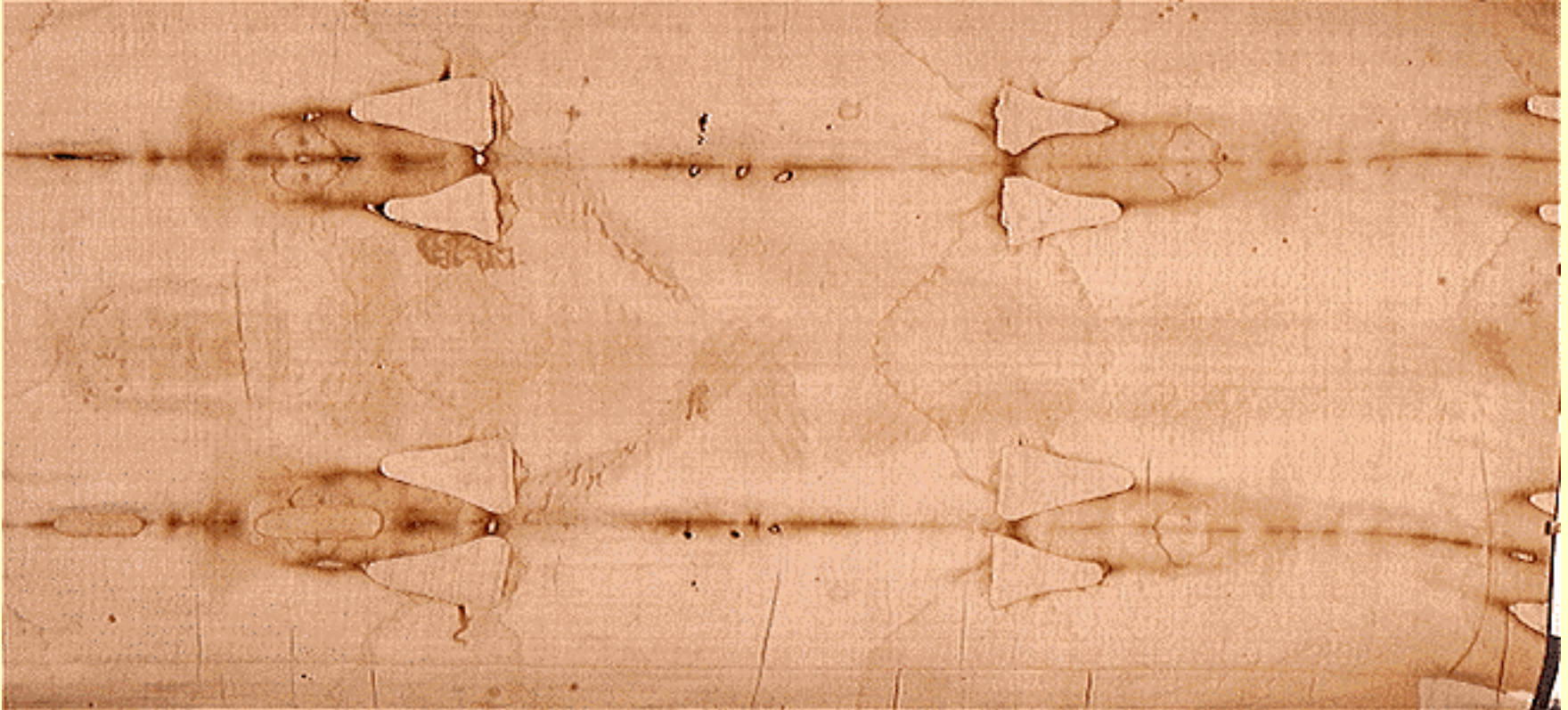




History and Iconography of the Shroud

- There is *no* authentic historical or archaeological record of the Shroud before 1355. Such “records” are pure speculation and wishful thinking on the part of authenticity believers. For example, Ian Wilson’s suggestive journey of the Shroud from Palestine to Turkey to France is completely fabricated and speculative; there is no historical evidence supporting it.
- Primary historical evidence—the d’Arcis Memo—proves that an artist created the Shroud about the year 1354.
- The image of the face of Jesus on the Shroud was taken from the standard Byzantine style, not the other way around as claimed by Sindonologists.
- The unnatural elongated body shape and extremities of Jesus on the Shroud represent the linear, elongate style characteristic of the Late Medieval or High Gothic of 1250-1400 C.E.
- The lower face of Jesus is unnaturally elongated, again representative of the Gothic style. Real humans have their eyes in the middle of their faces; Byzantine art, Gothic art, and the Shroud all have the eyes of human representations *above* the midpoint of the faces.

History of the Shroud



History of the Shroud

3a. The memorandum of Bishop d'Arcis of Troyes, written c.1389. Prior to the carbon-dating this provided the prime evidence for the Shroud's alleged mediaeval date.



Fig. 5. "Memorandum" attributed to Pierre d'Arcis, Bishop of Troyes (1379-1395). Phot. Bibl. nat., Paris (Champagne 154, p. 137).

History of the Shroud



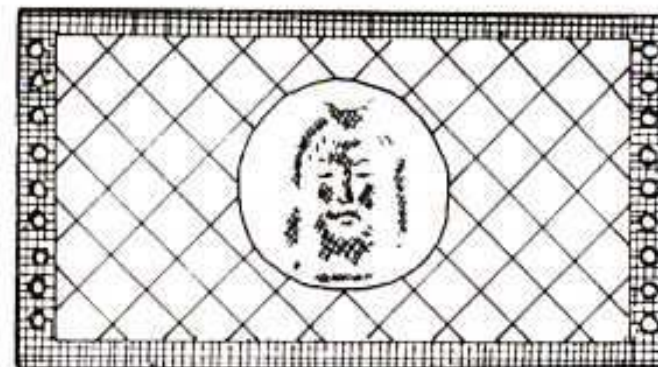
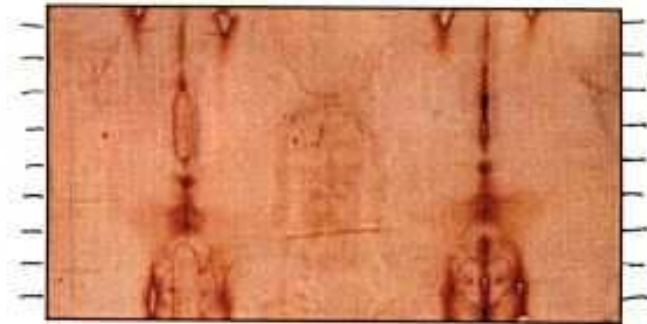
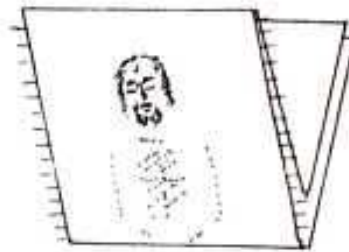
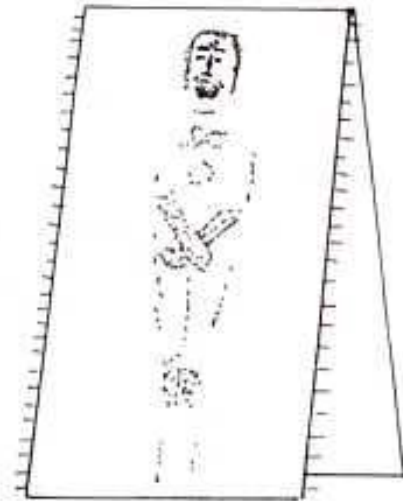
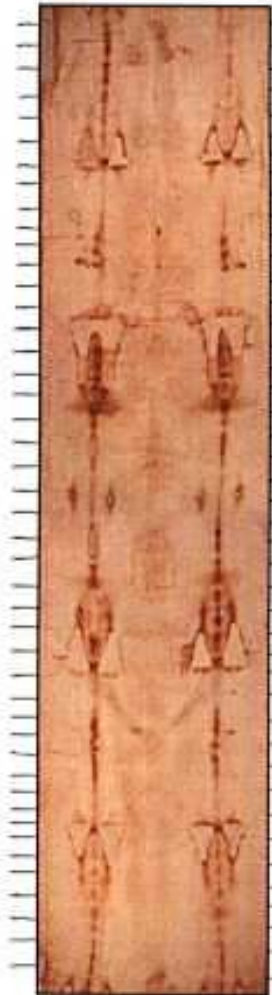
Iconography of the Shroud



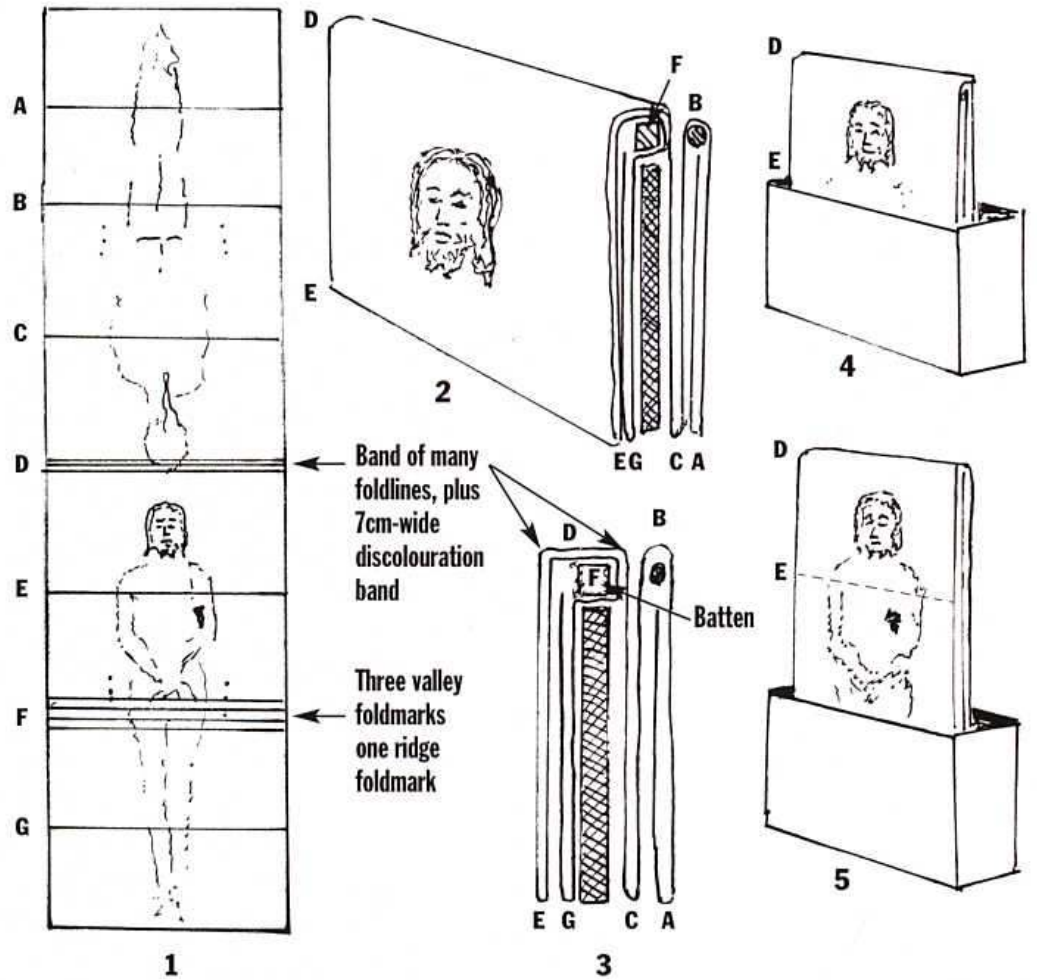
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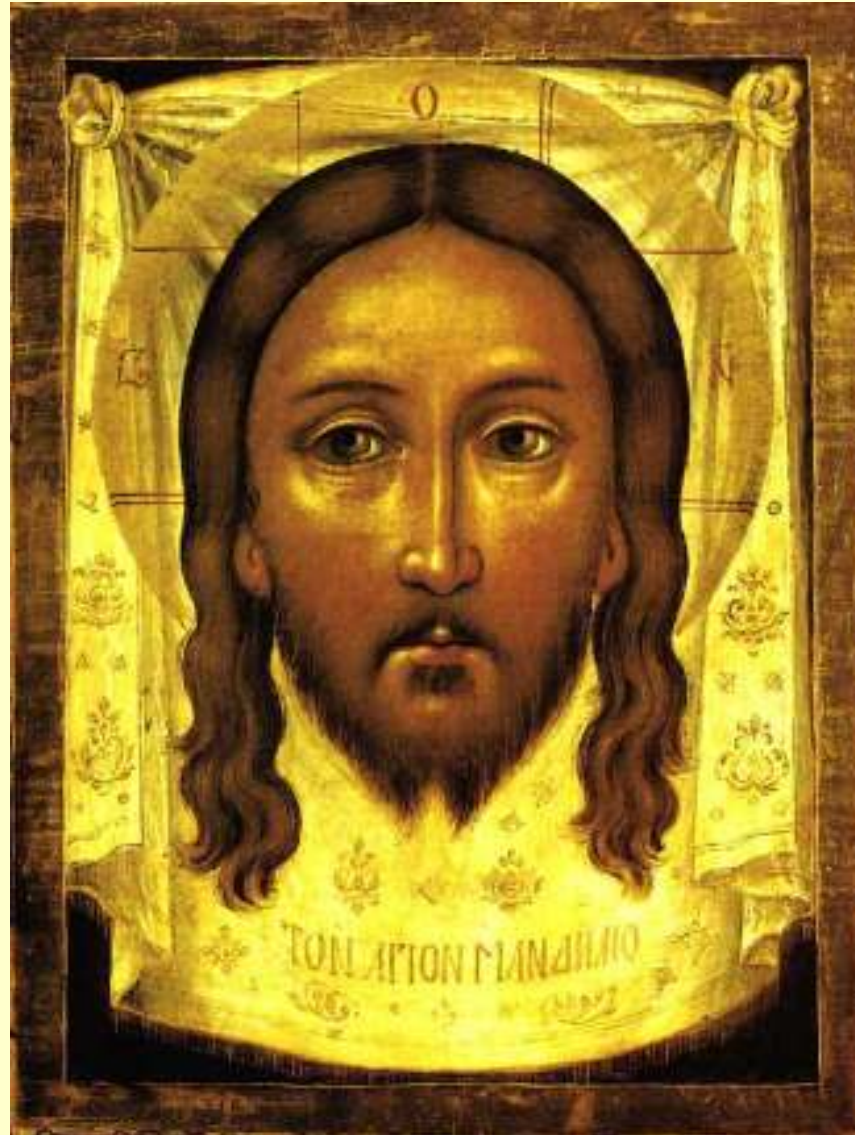
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Iconography of the Shroud



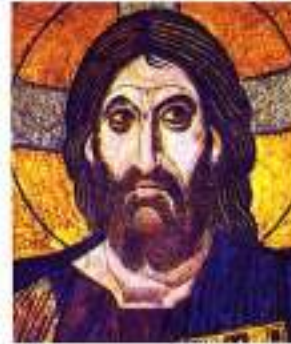
Iconography of the Shroud



Iconography of the Shroud



A 11th century



B 11th century



C 16th century



D 16th century



E 16th century



F 16th century

Iconography of the Shroud



- Fig. 92. Facial markings found on the Shroud.
1. A transverse streak across the forehead.
 2. The three-sided "square" on the forehead.
 3. A V-shape at the bridge of the nose.
 4. A second V-shape, inside the three-sided square.
 5. A raised right eyebrow.
 6. An accentuated left cheek.
 7. An accentuated right cheek.
 8. An enlarged left nostril.
 9. An accentuated line between the nose and the upper lip.
 10. A heavy line under the lower lip.
 11. A hairless area between the lip and the beard.
 12. The forked beard.
 13. A transverse line across the throat.
 14. Heavily accentuated, owl-like eyes.
 15. Two loose strands of hair falling from the apex of the forehead.

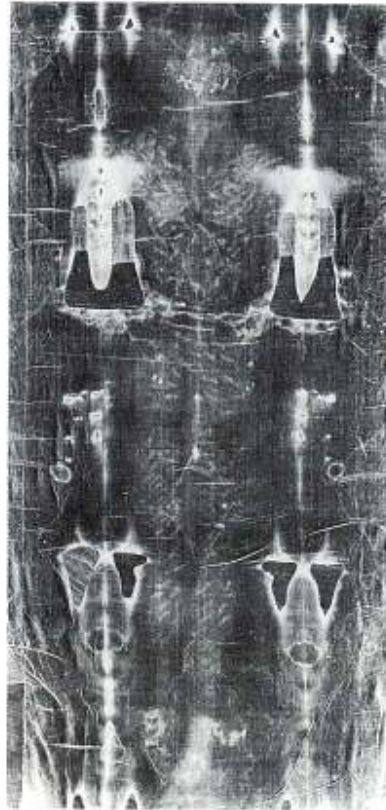


(clockwise from top left) Fig. 93. Christ Pantocrator mosaic, dome of church of Daphni, ca. 1050–1100. Fig. 94. Christ Pantocrator mosaic, in the Apse of Cefalù Cathedral, Sicily, 1148. Fig. 95. The face of Jesus, Martorana, Palermo, Sicily, ca. 1148. Fig. 96. Christ Enthroned, mosaic in the narthex of Hagia Sophia, Constantinople, late 800s. Fig. 97. Christ the Merciful, icon in mosaic, Ehemals, Staatliche Museum, Berlin, 1000s. Fig. 98. Icon at Dormitron Cathedral, Moscow, 1100s.

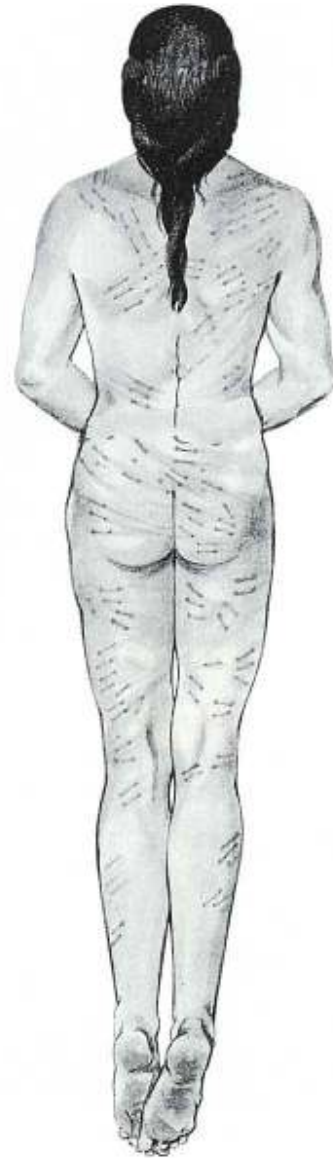


(left to right, top to bottom) Fig. 99. Icon at St. Ambrose, Milan, 700s. Fig. 100. Mandylion of the Comnenus period, 1100s. Fig. 101. Christ Enthroned, Monastery of Chilandari, Mt. Athos, Greece, 1200s. Fig. 102. Mosaic of Jesus, National Museum, Florence Italy, 1100s. Fig. 103. Pantocrator, mosaic, Holy Luke Monastery, 1100s. Fig. 104. Christ Pantocrator, fresco, from the dome of the Karanlik Monastery Church, Cappadocia, early 1100s. Fig. 105. Christ Enthroned Fresco, Church of St. Angelo in Formis, Capua, Italy, 900s. Fig. 106. Icon at St. Bartholomew's, Genoa, 1200's. Fig. 107. Bust of the Savior in the Niche of the Pallium, immediately above the Tomb of St. Peter. Vatican Grottoes, mosaic from the 700s. Fig. 108. The face of Jesus, Martorana, Palermo, Sicily, 1100s.

History of the Shroud



14a. The Shroud back of the body image, seen in negative.



14b. Plan of the distribution of the apparent wounds from whipping.

History of the Shroud

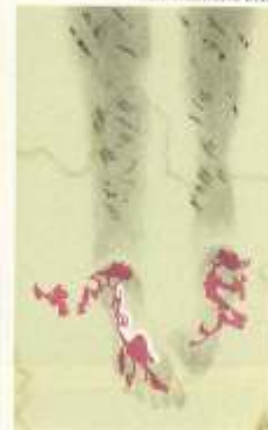


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Apparent absence of thumbs on the hands (left) may be related to nail penetration through the wrists. Such piercing might stimulate the median



NATIONAL ANTHROPOLOGICAL ARCHIVES

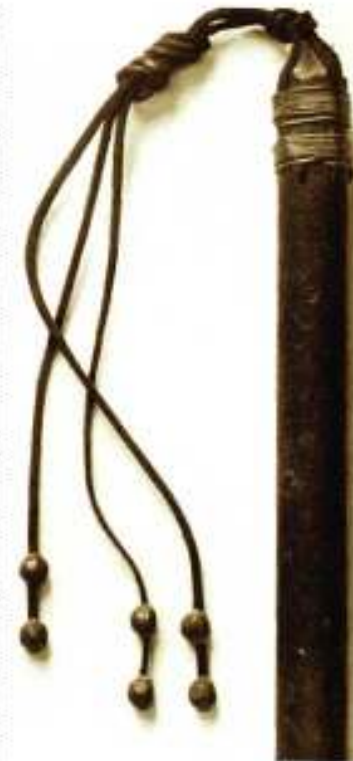
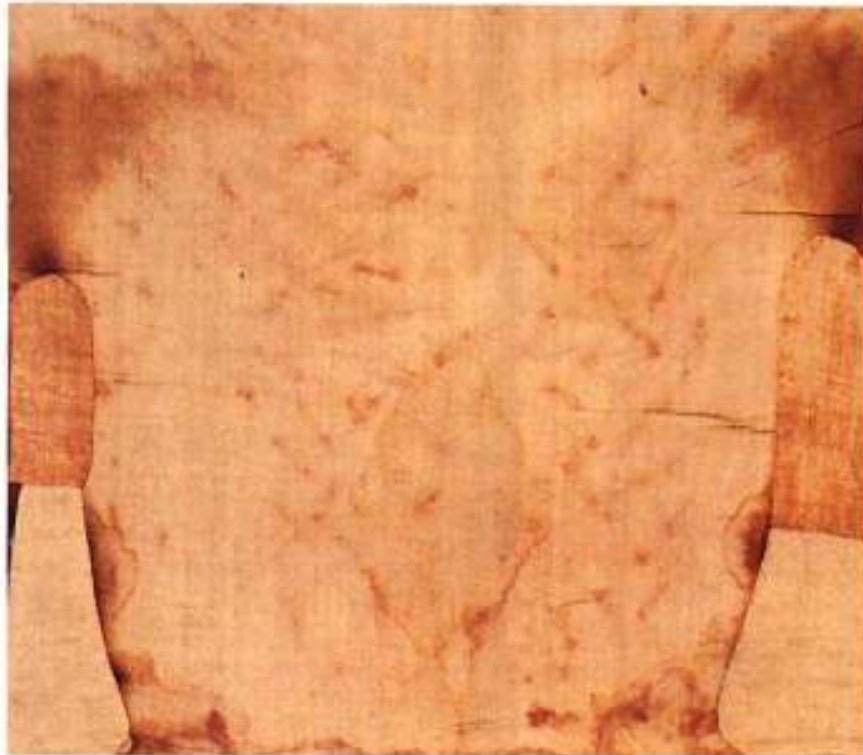


nerve and cause an involuntary contraction of the thumbs.

Auras around "blood" on the wrist and one foot (detailed in **diagram**) are also thought by some to be signs of sex. Watery serum is squeezed out of clotting blood.

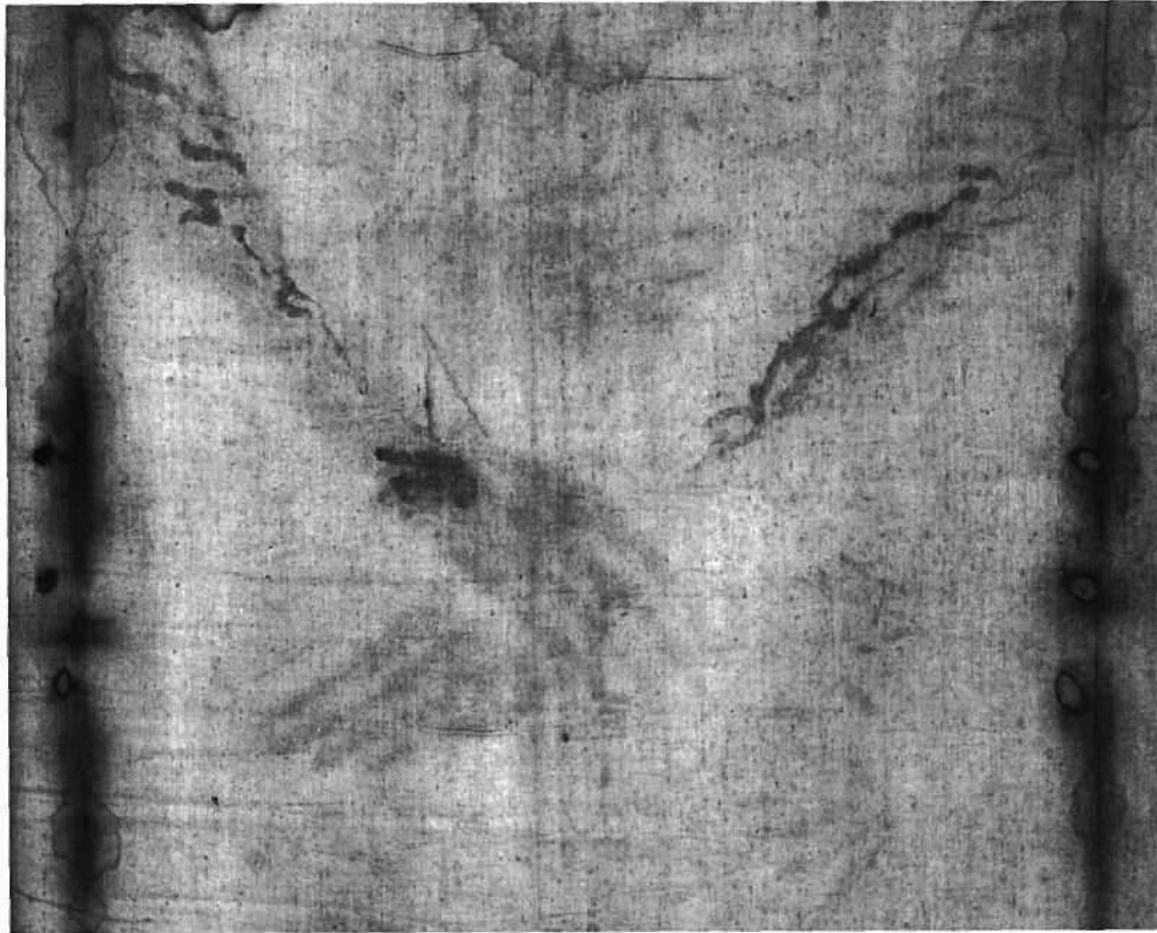
Five diagonal scratches, found with scabrous marks, are revealed in these ultraviolet fluorescence photographs. They appear strongest on the back of the legs (left).

History of the Shroud



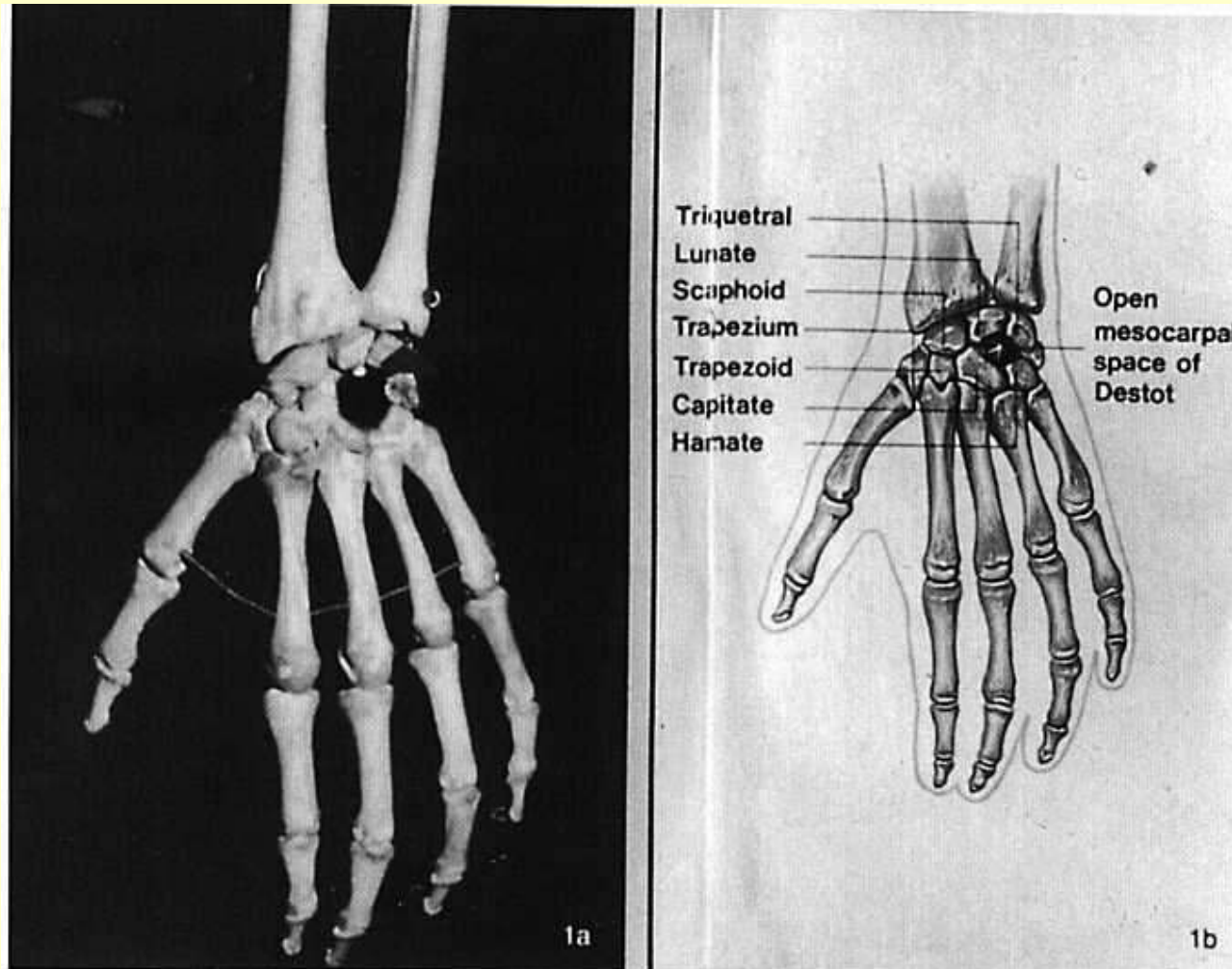
ABOVE LEFT: The upper back region of the Shroud's back-of-the-body imprint, showing it to be peppered with faint dumb-bell-shaped marks corresponding to the double pellets of lead or bone that tipped the Roman scourge weapon the flagrum (above right).

History of the Shroud



18a. Close-up of the 'crossed hands' area on the Shroud bloodflows.

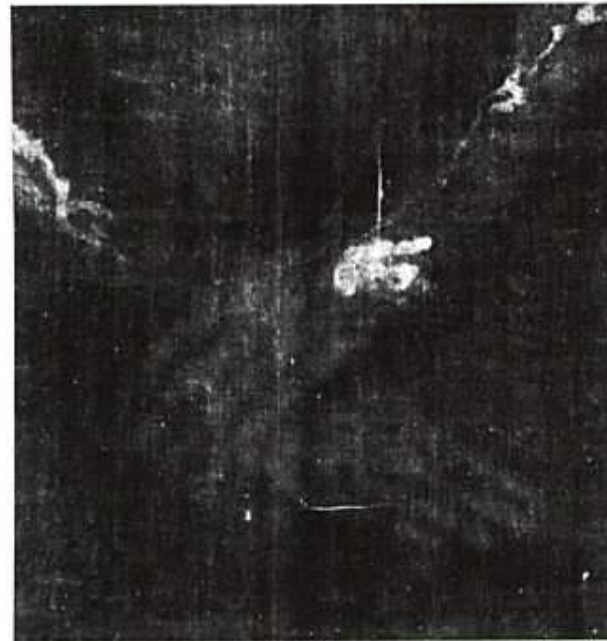
History of the Shroud



19a. X-ray views of the hand, showing likely position of nail in the wrist.

History of the Shroud

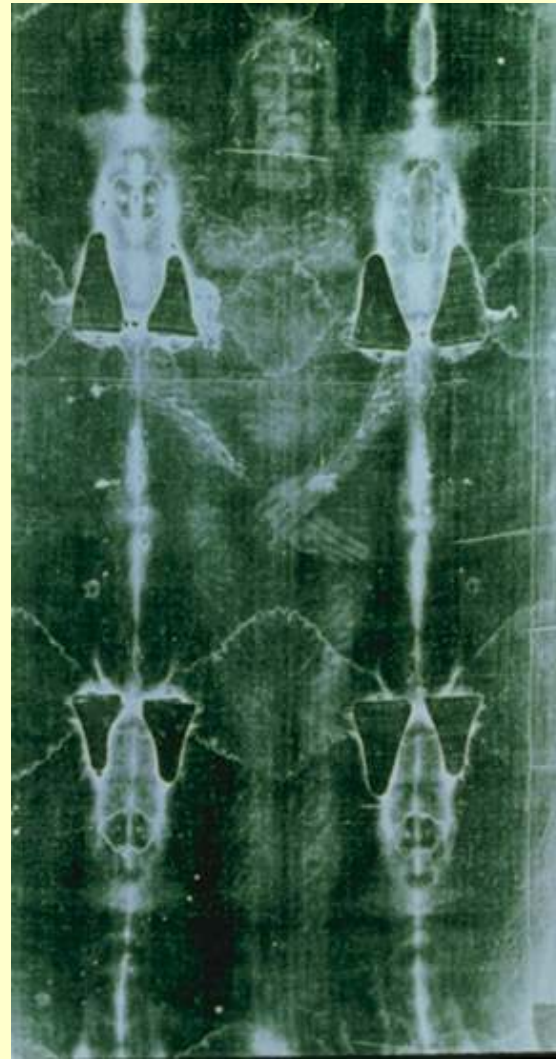
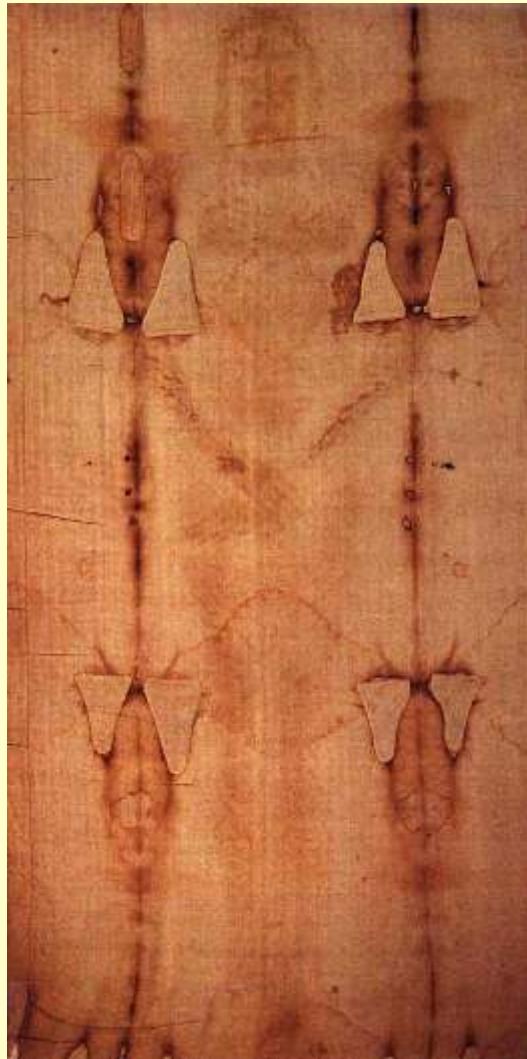
Nor is even this 3-D effect all. When in the early 1980s the Eastern Michigan University chemist Dr Giles Carter was studying some of the life-sized photographs taken by the STURP team he noticed that the man of the Shroud's fingers looked unnaturally long and bony. As he pondered this it suddenly struck him that the bones of the hand seemed to be showing up as if under an X-ray. In the area of the mouth on the Shroud, he further



Iconography of the Shroud



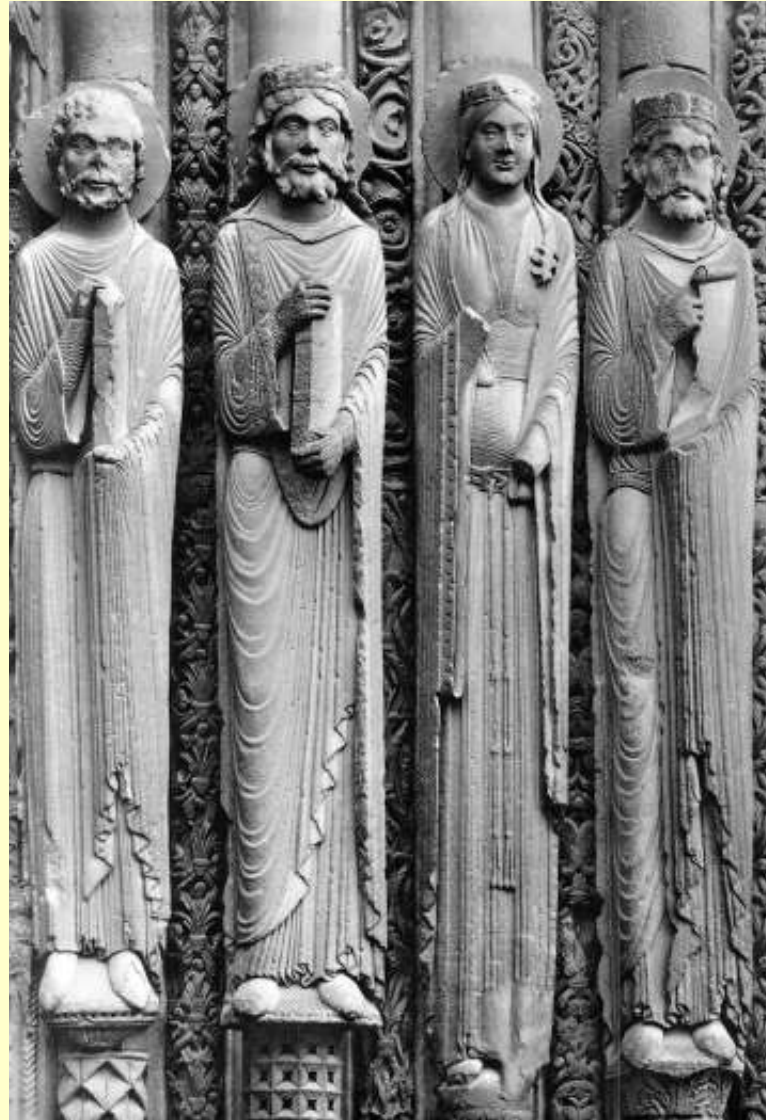
Iconography of the Shroud



Iconography of the Shroud



Iconography of the Shroud



Iconography of the Shroud



Iconography of the Shroud



Iconography of the Shroud



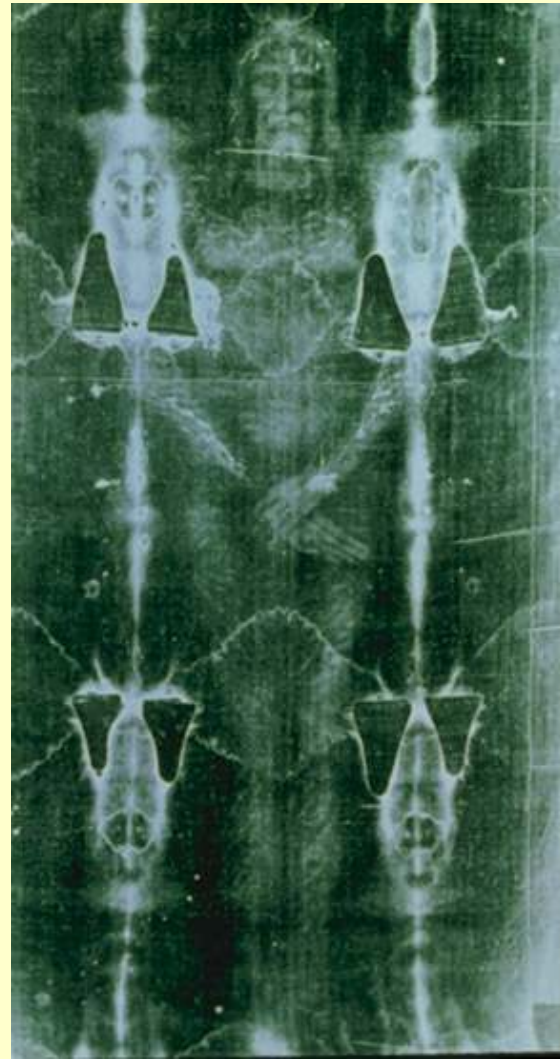
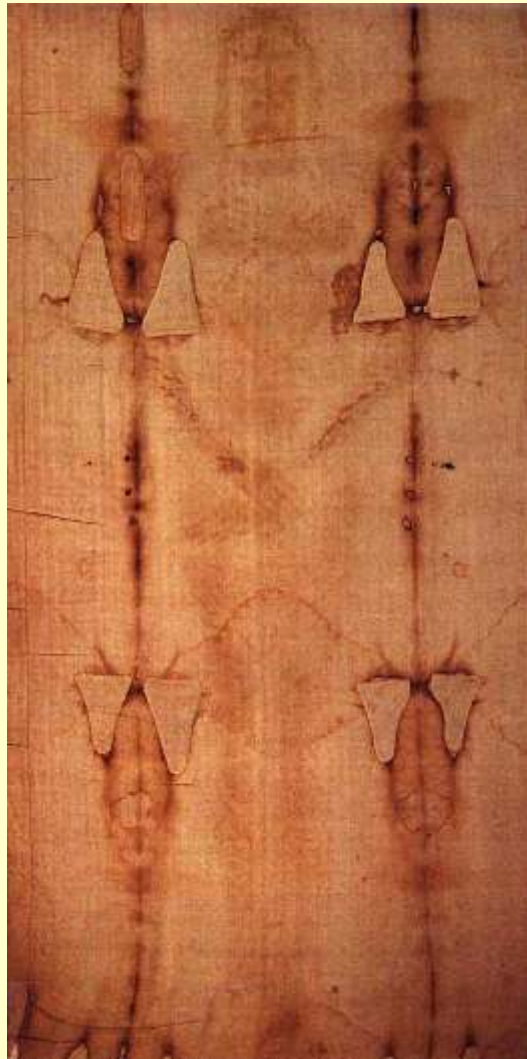
Iconography of the Shroud



Iconography of the Shroud



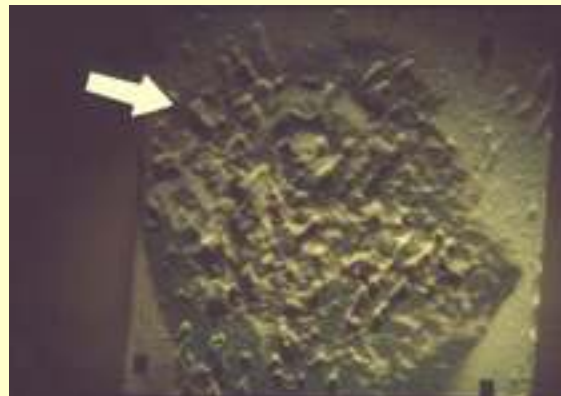
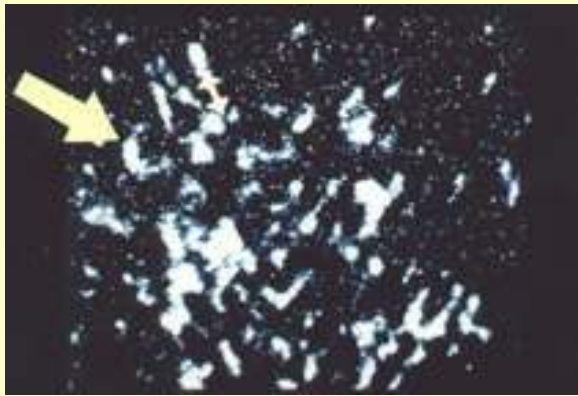
Iconography of the Shroud



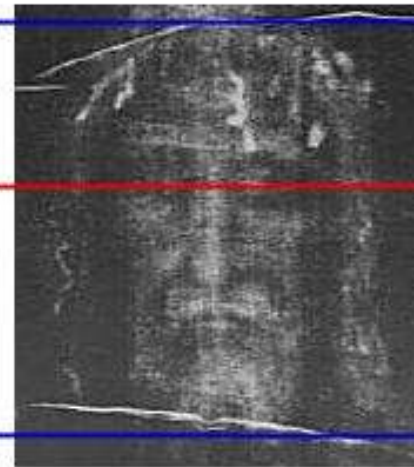
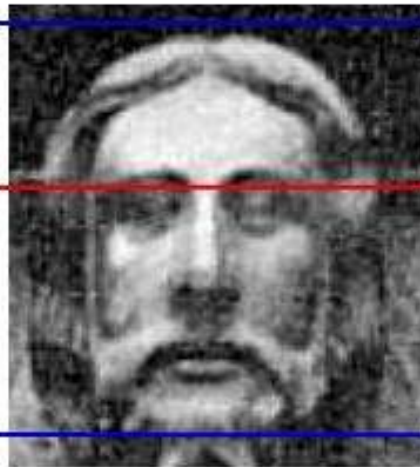
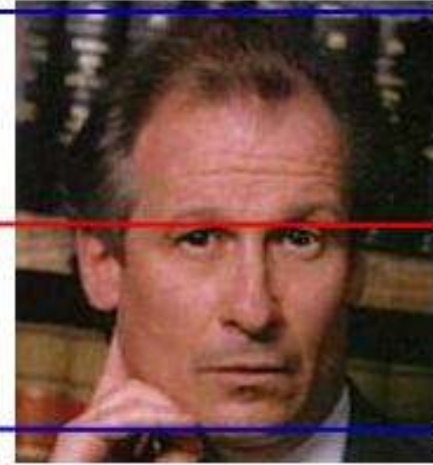
History of the Shroud



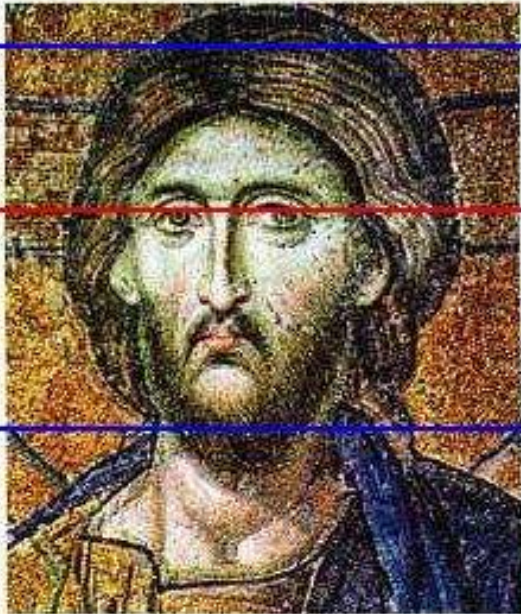
History of the Shroud



Iconography of the Shroud



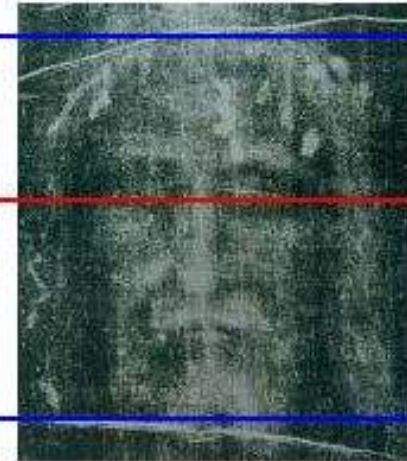
Iconography of the Shroud



A 12th century



B 11th century



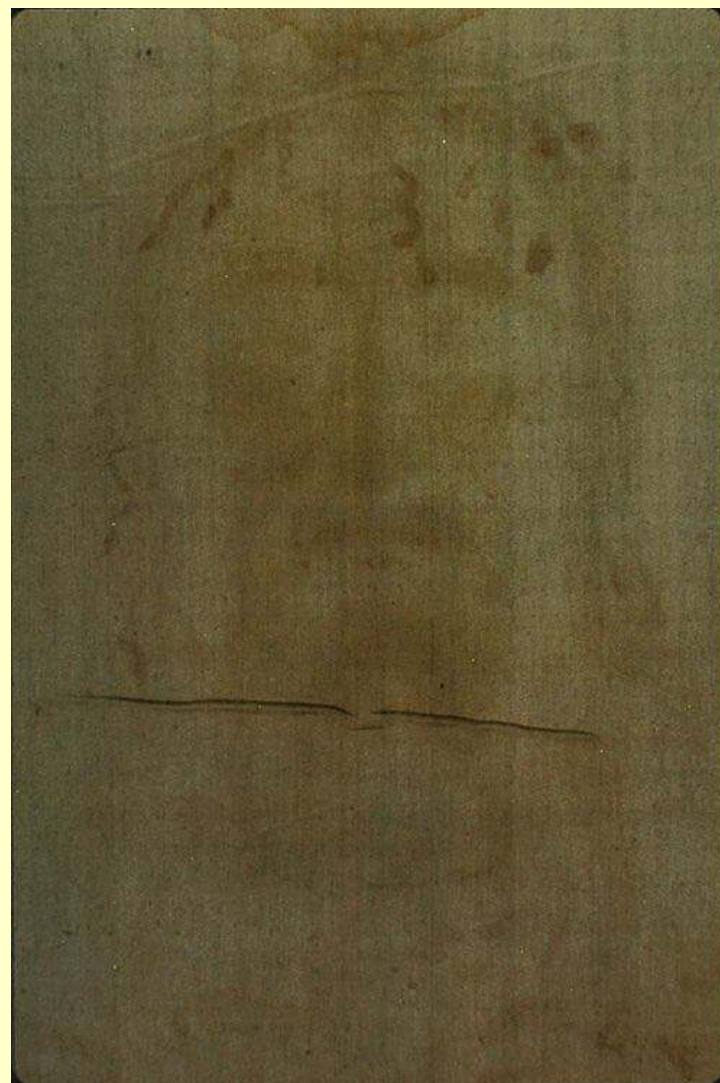
Iconography of the Shroud



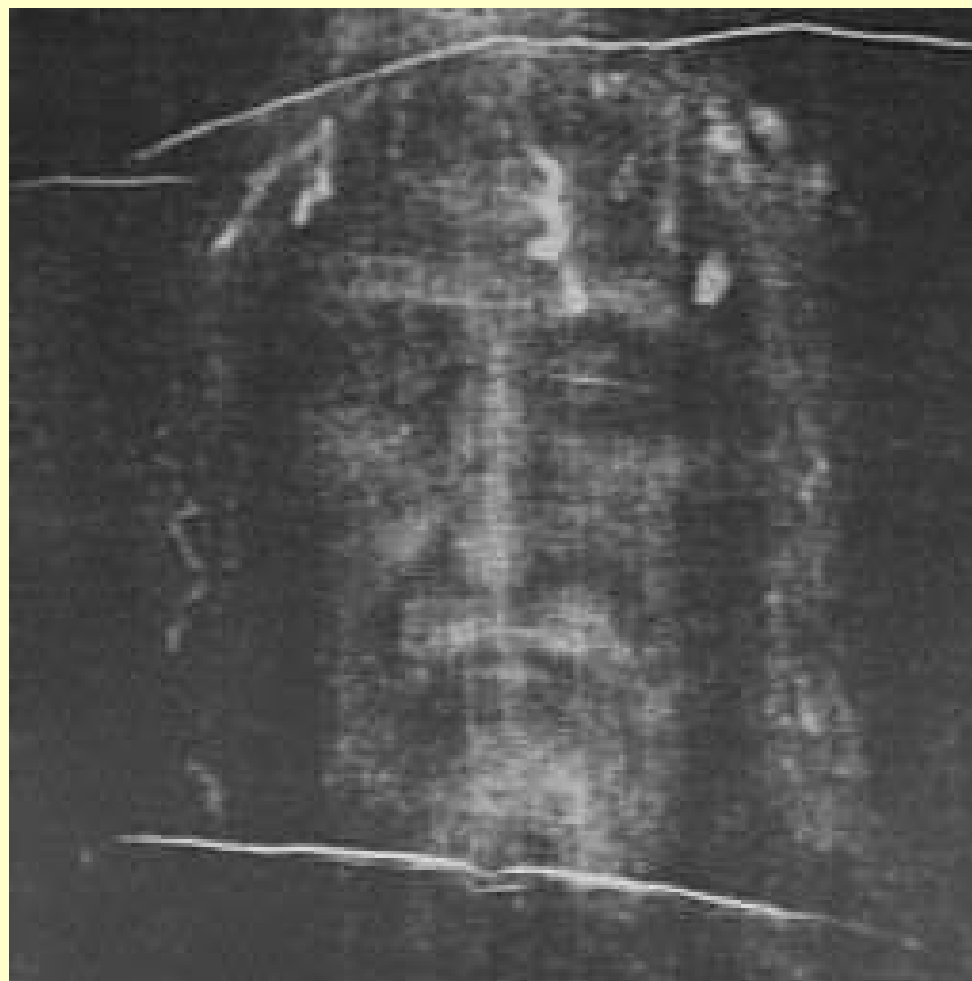
Photographic Image of the Shroud

- Contrary to the claims of Sindonologists and other advocates of authenticity, the Shroud image is *not* a photographic negative. If it *were* a true photographic negative, the Shroud image would have light—not dark—blood, hair, beard, and moustache, which is completely unrealistic.
- The Shroud image is a *false* negative image, characterized by greater tonal densities at higher points on the face and body, and lesser tonal densities on face and body depressions.
- Such a characteristic tonal density variation would be expected when pigment is applied to linen on a bas-relief rubbing, as hypothesized and demonstrated by Joe Nickell. Also, it is possible to perfectly replicate this effect by directly painting a quasi-negative image on cloth, as demonstrated and advocated by Walter McCrone.

Photographic Image of the Shroud



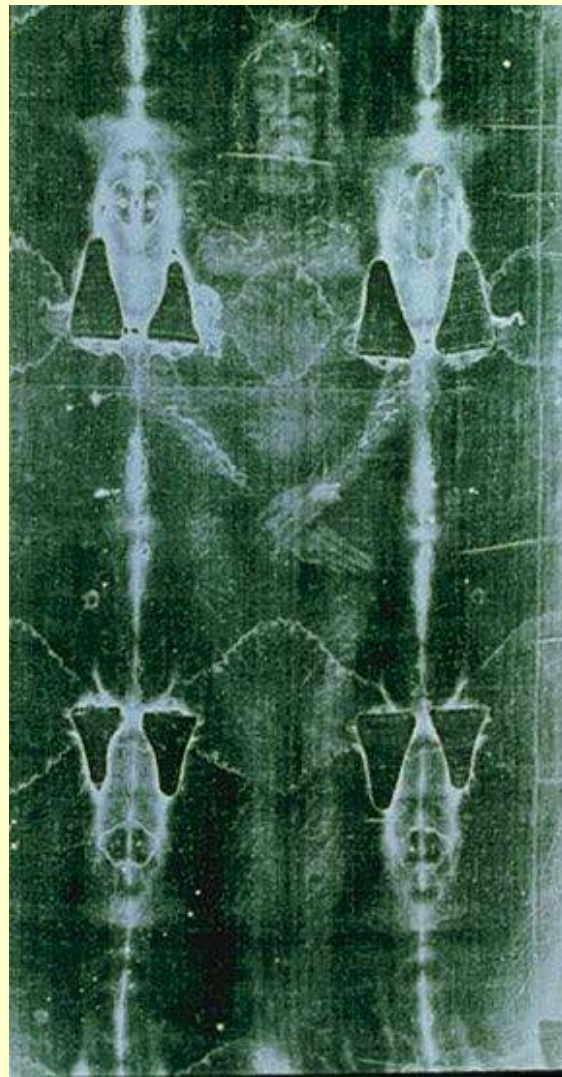
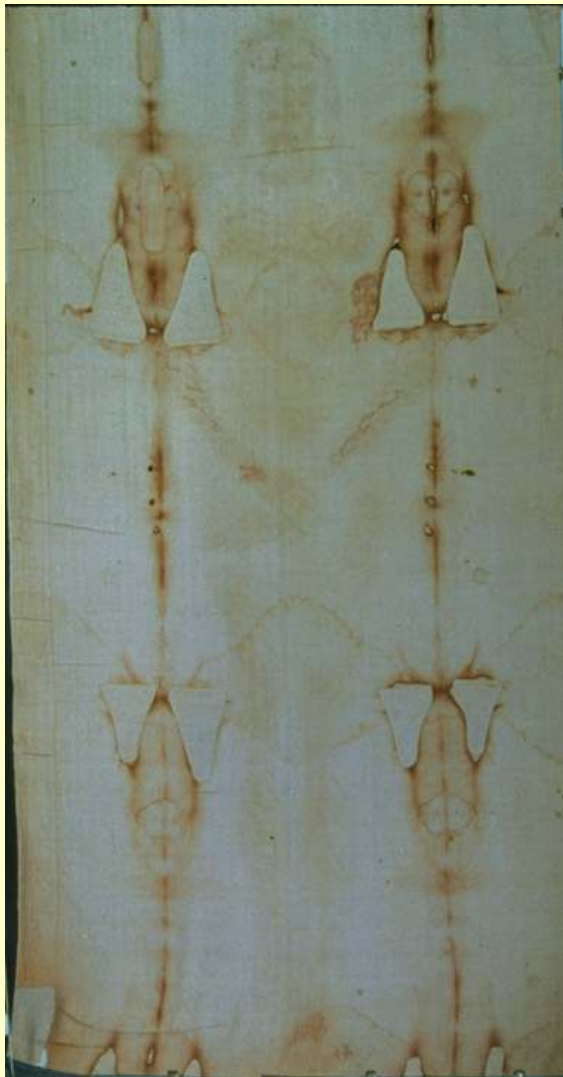
Photographic Image of the Shroud



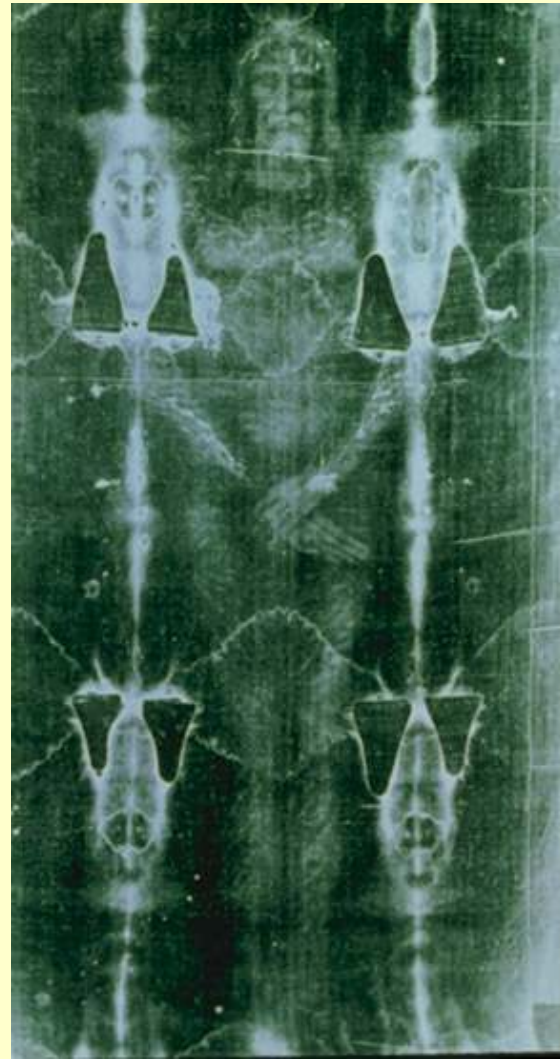
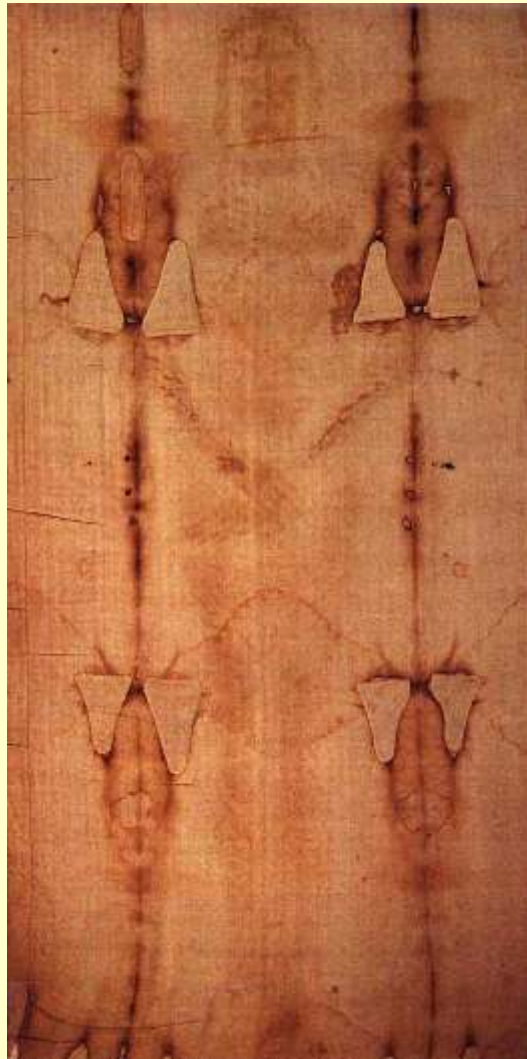
Photographic Image of the Shroud



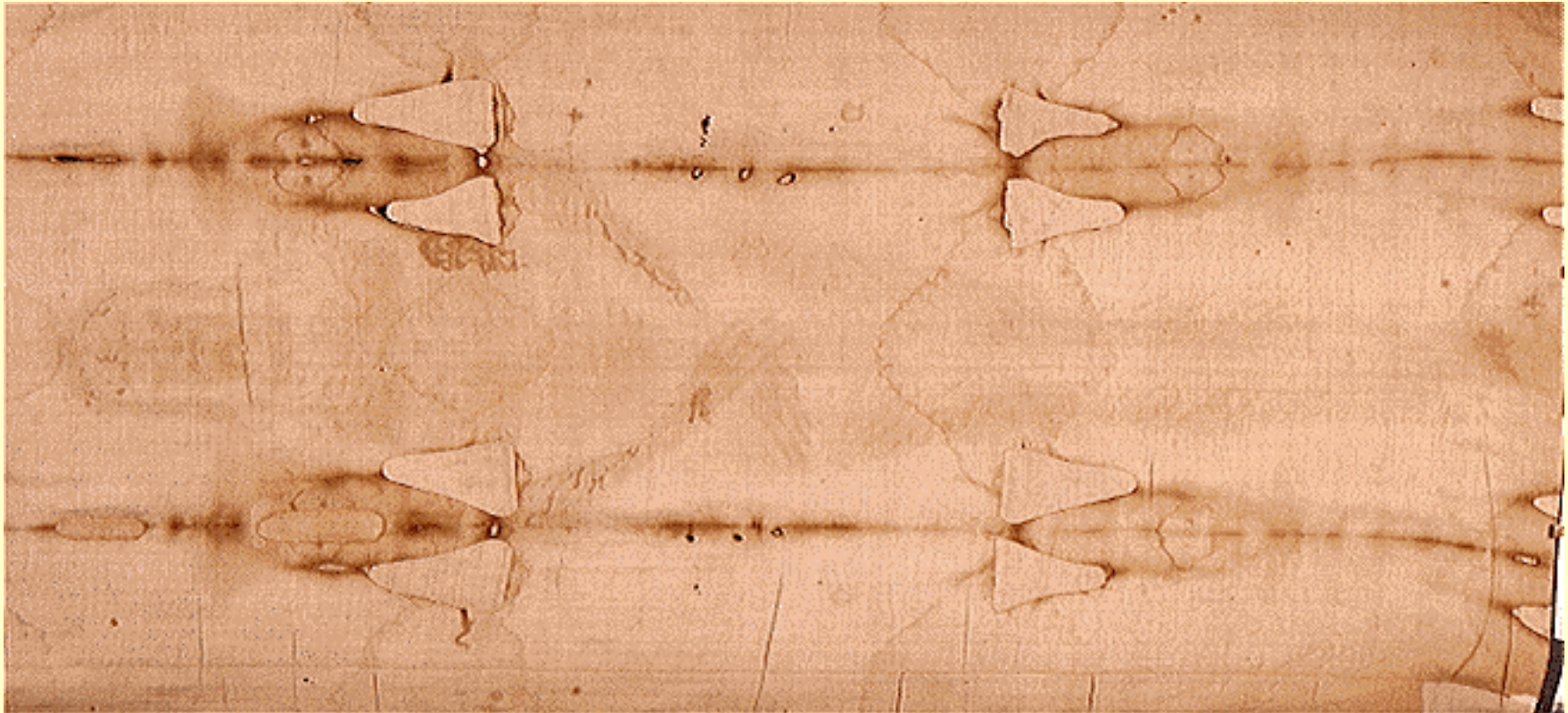
Photographic Image of the Shroud



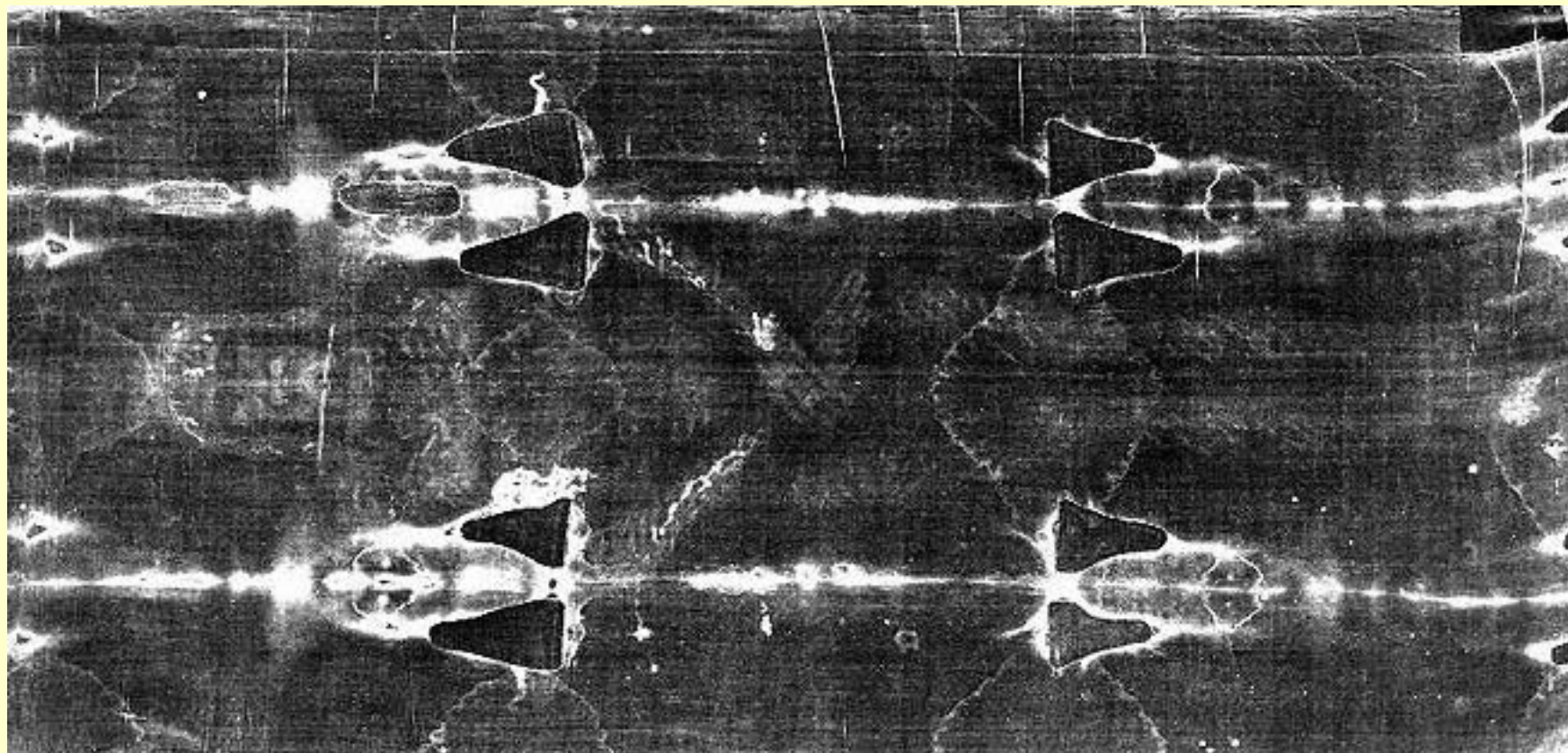
Photographic Image of the Shroud



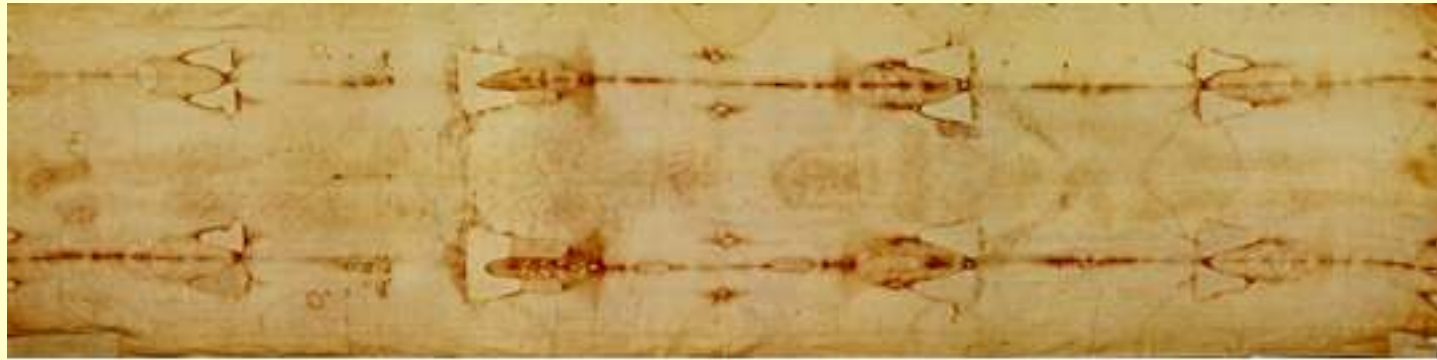
Photographic Image of the Shroud



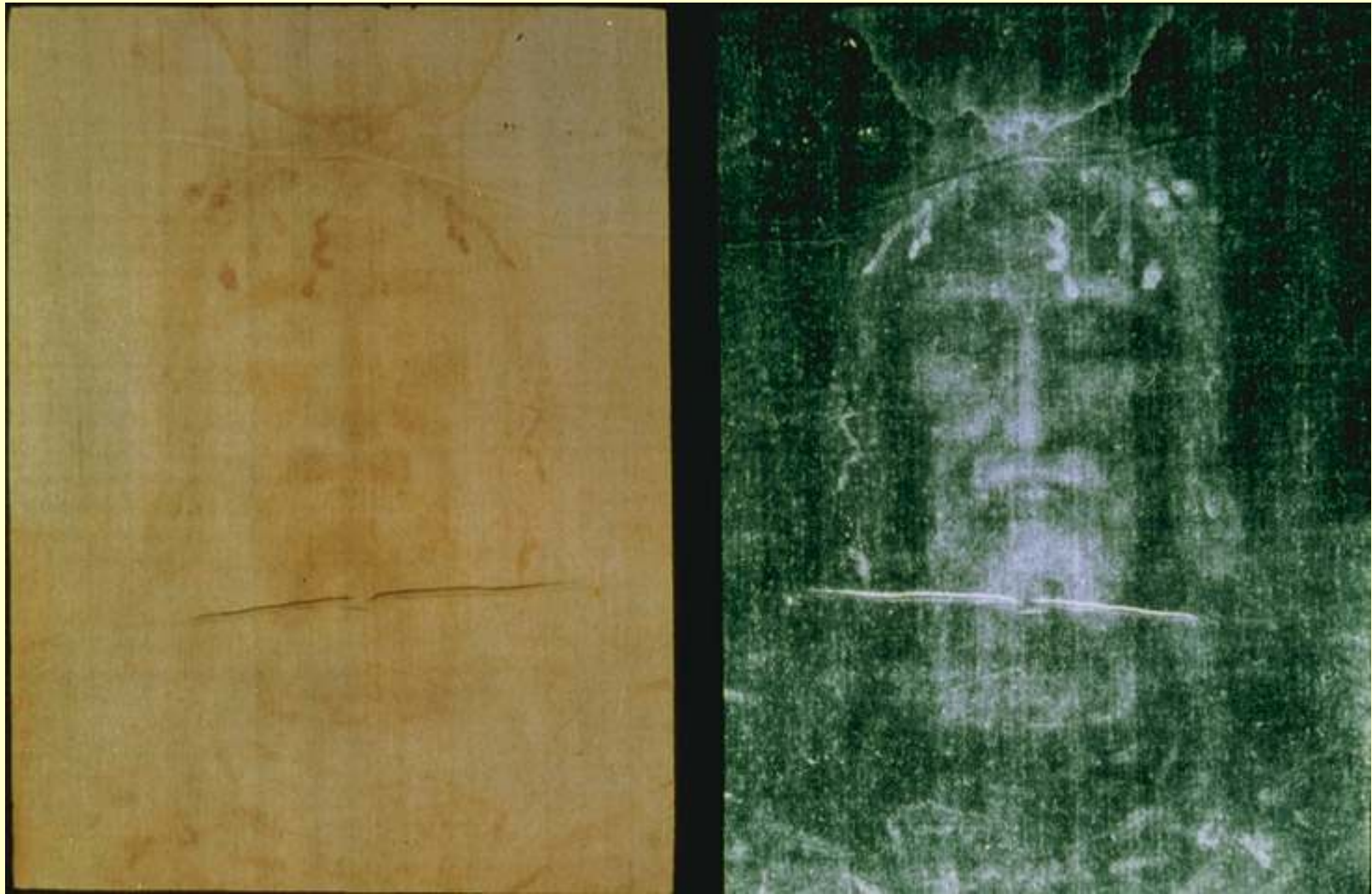
Photographic Image of the Shroud



Photographic Image of the Shroud



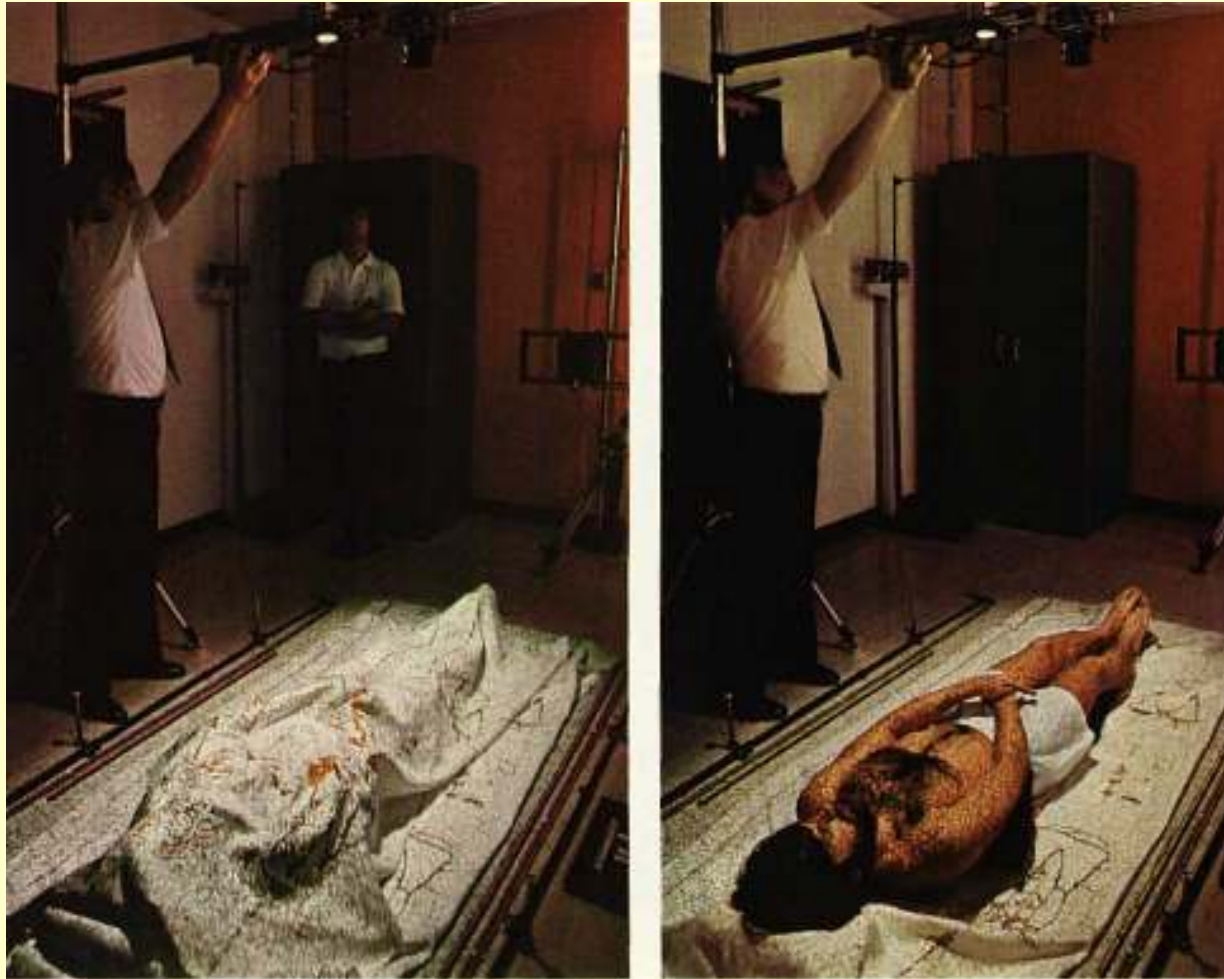
Photographic Image of the Shroud



Three-Dimensional Aspect of the Shroud

- Contrary to the frequent but erroneous claims by Shroud authenticity proponents, the three-dimensional quality of the Shroud image—when accessed, processed, and viewed using an image analyzer that converts tonal gradations in the original image to a processed image that gives the impression of topographic relief or height—is nothing unusual, wonderful, miraculous, or unexplainable.
- To the contrary, it is easily explained by the gradual tonal gradations in the Shroud image that were created by the artist, probably using a bas-relief impression that automatically results in such tonal gradations.
- Other artists have re-created this effect using both painting and bas-relief rubbings.

Three-Dimensional Aspect of the Shroud



To map a shroud-covered body, stereometric photography charts contours. A man matching the height (approximately 5 feet 11 inches) and build of the image is photographed under a shroud replica (above left), and then uncovered (above center). Contours are compared to measure cloth-to-body distances. Experiments

Three-Dimensional Aspect of the Shroud



Three-Dimensional Aspect of the Shroud



ALL BY NATIONAL GEOGRAPHIC PHOTOGRAPHER VICTOR R. GOSWELL, JR.

show that intensity of the shroud body image varies in proportion to the distance between cloth and body. Scientists John Jackson and Eric Jumper (above, left and right foreground) also dressed models with chin bindings, forehead phylacteries, and coins on the eyes, images of which some believe they see on the shroud.

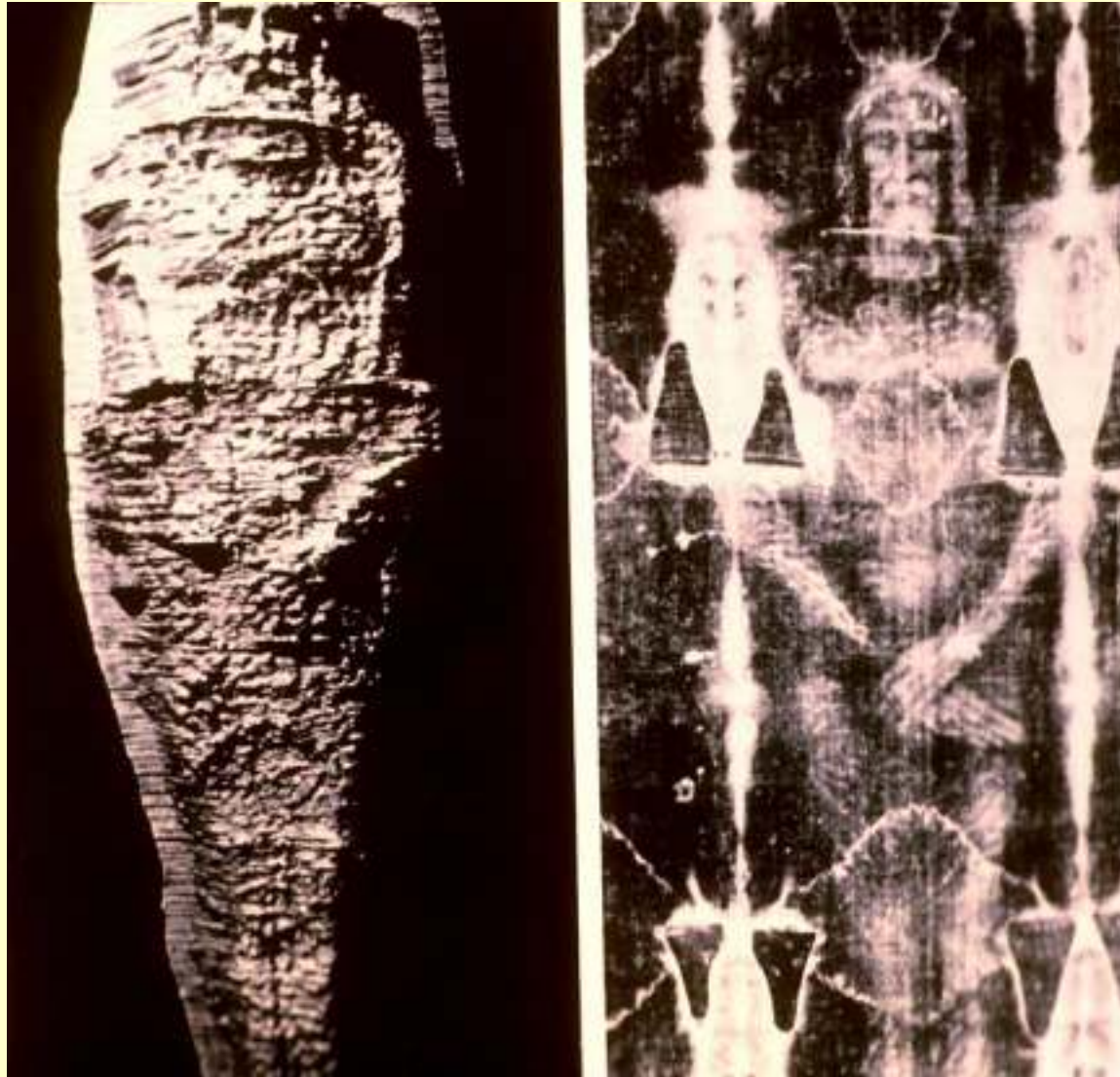
Three-Dimensional Aspect of the Shroud



Three-Dimensional Aspect of the Shroud



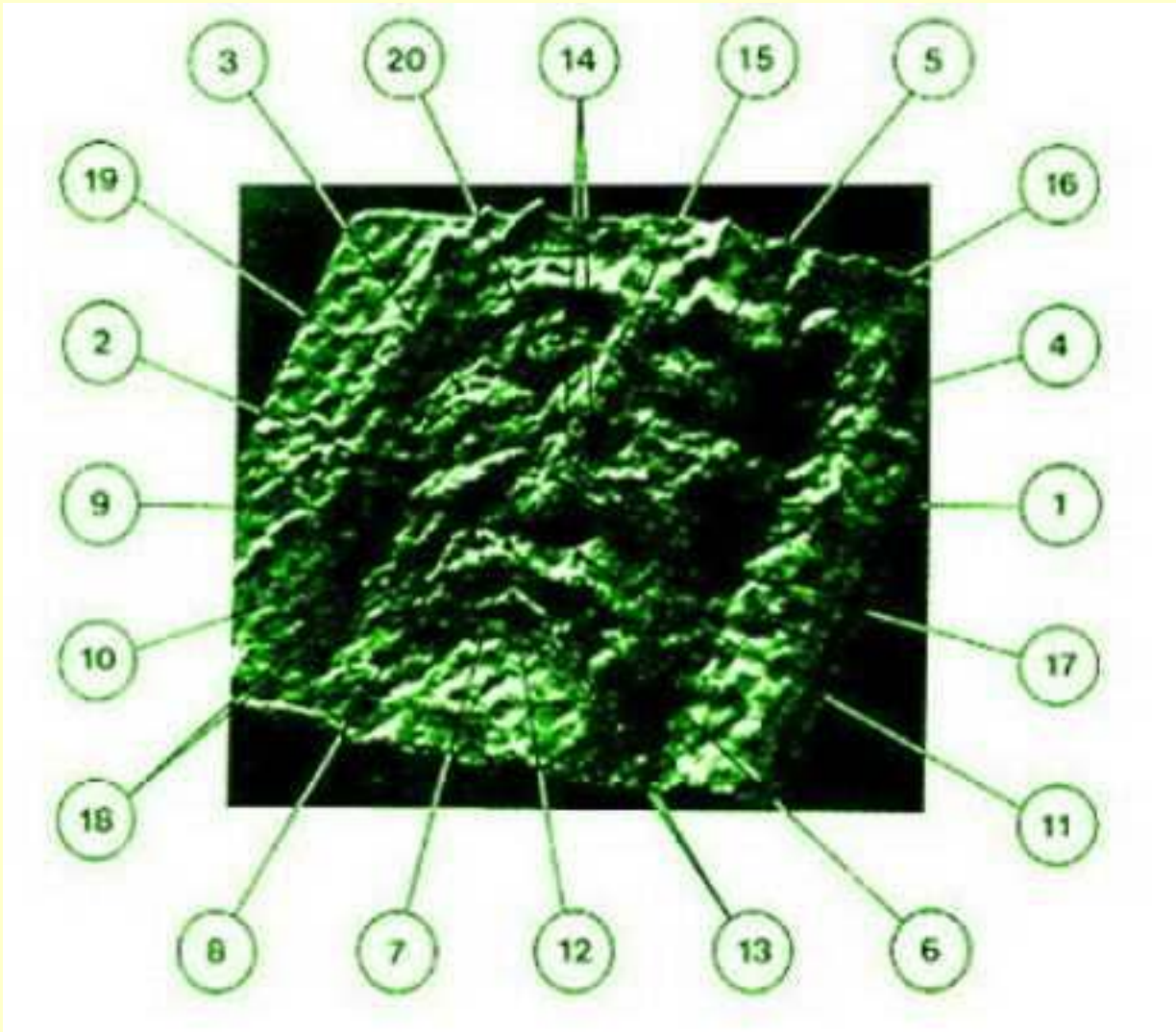
Three-Dimensional Aspect of the Shroud



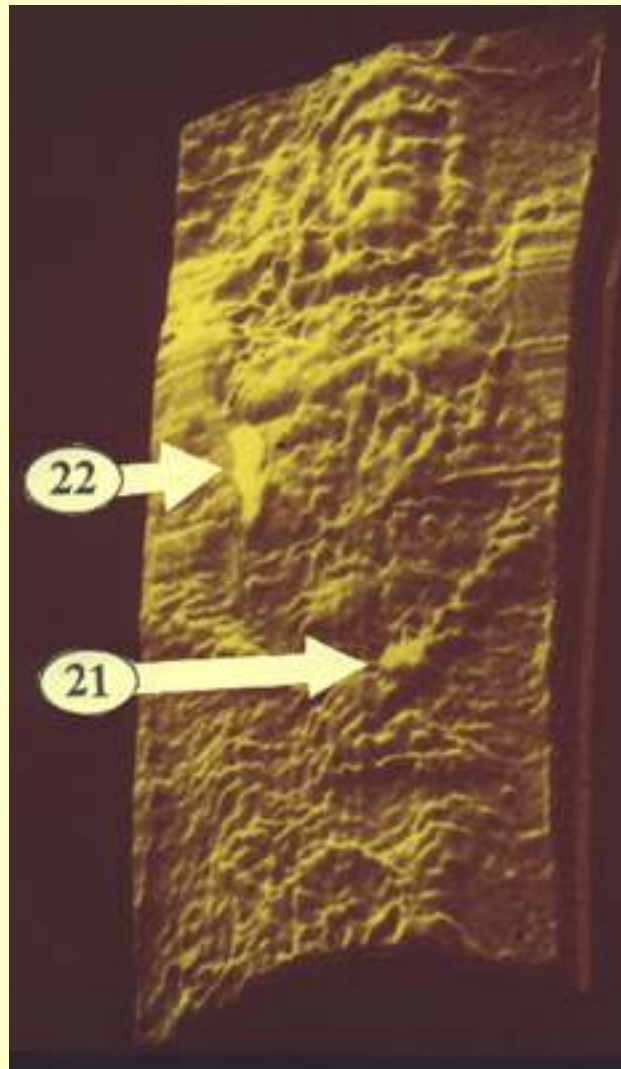
Three-Dimensional Aspect of the Shroud



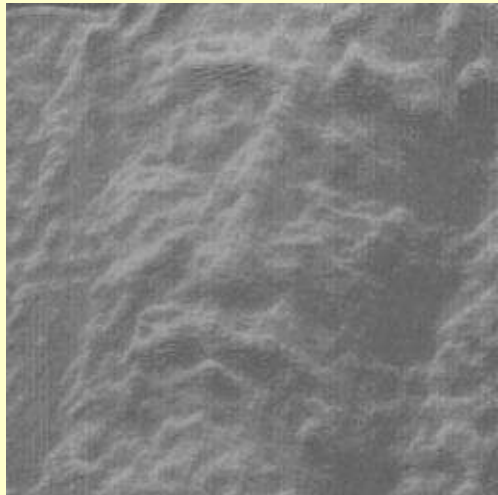
Three-Dimensional Aspect of the Shroud



Three-Dimensional Aspect of the Shroud



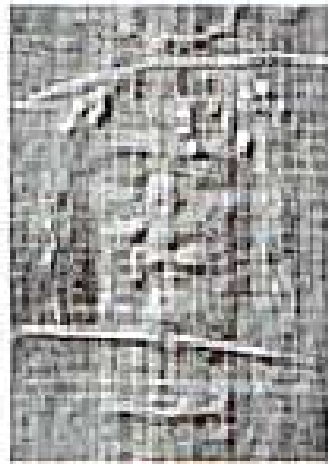
Three-Dimensional Aspect of the Shroud



Three-Dimensional Aspect of the Shroud



Three-Dimensional Aspect of the Shroud



Frontale



Posteriore



Frontale



Posteriore

Three-Dimensional Aspect of the Shroud



Three-Dimensional Aspect of the Shroud



Three-Dimensional Aspect of the Shroud

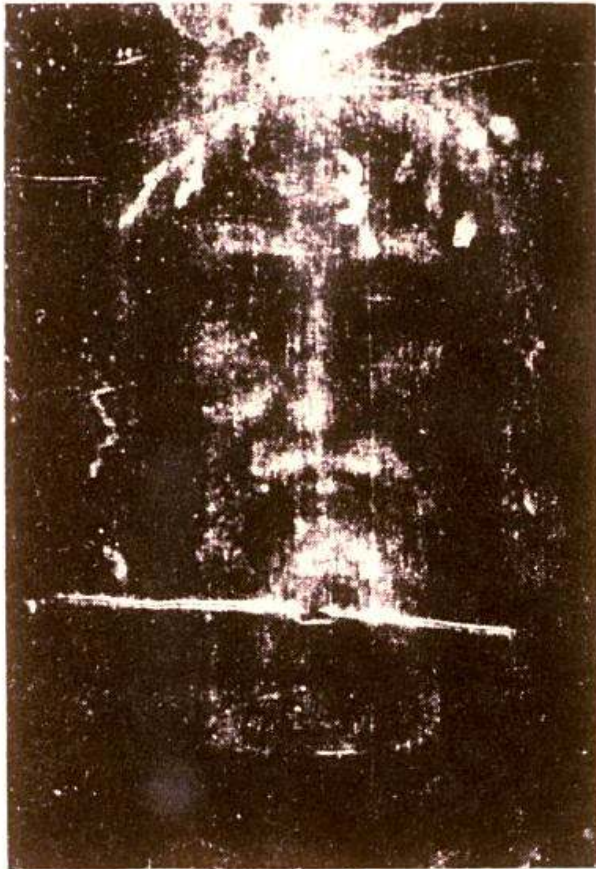


FIGURE 3: Image created with iron oxide/collagen dust.

(a) Initial image drawn on newsprint

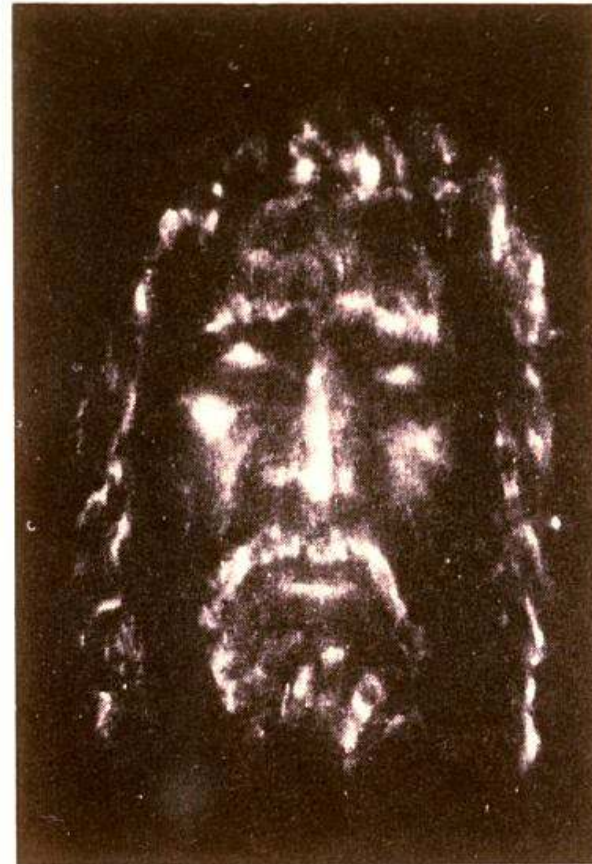
(b) Image on linen fabric after transfer.

Photographic Image of the Shroud



© 1980, Vernon Miller

FIGURE 2. Negative photograph of the face of the shroud image.



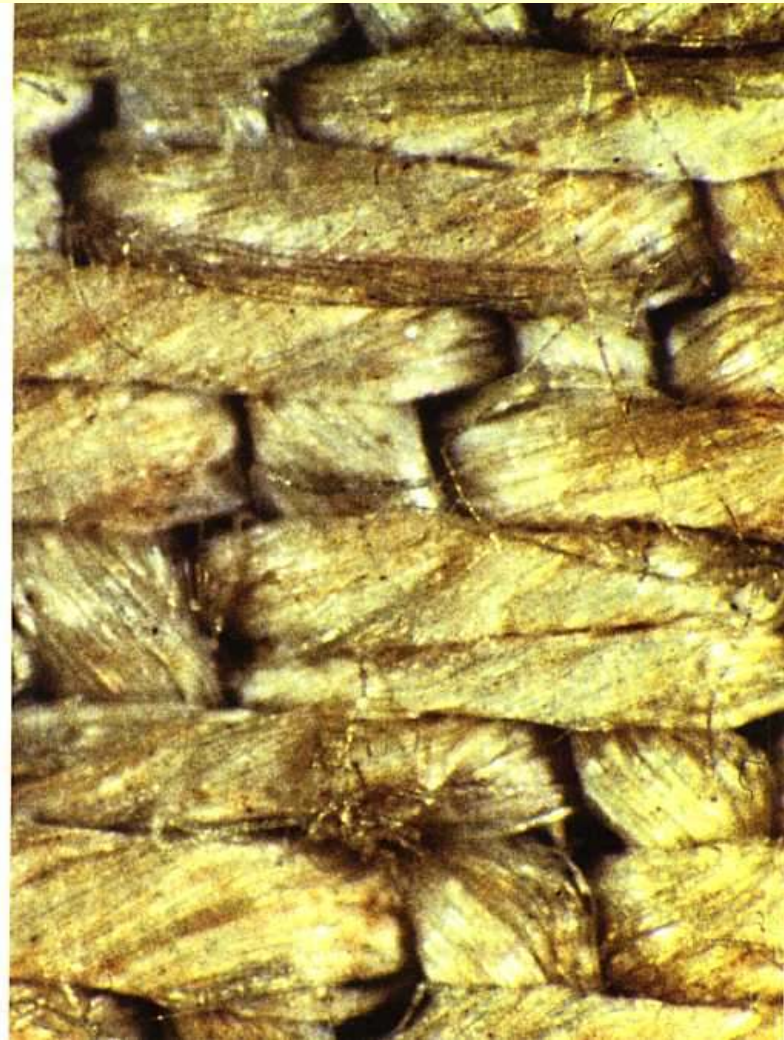
© 1981, Joe Nickell

FIGURE 3. Negative photograph of a rubbing image done by Joe Nickell using iron oxide as the pigment.

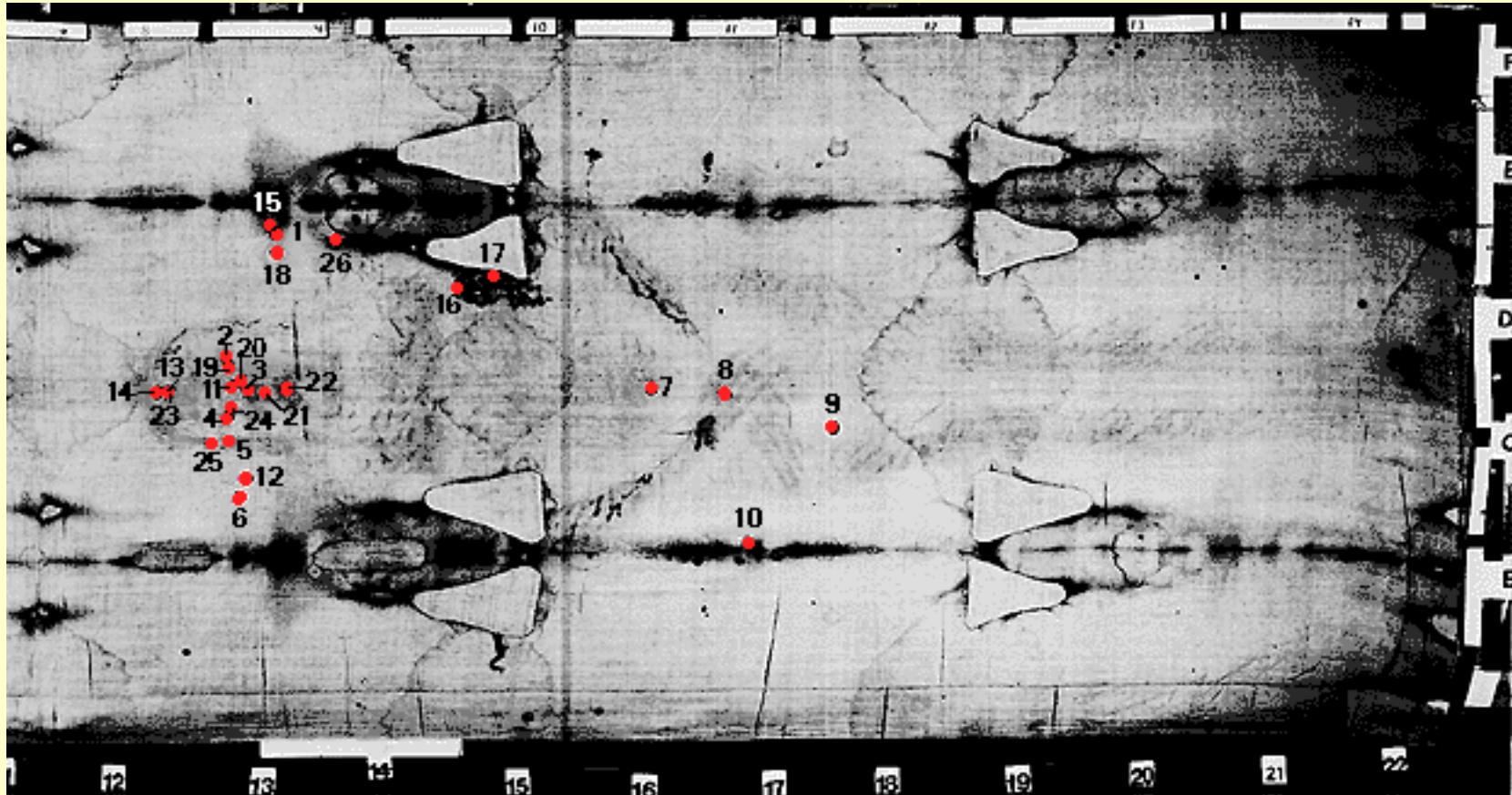
Formation of the Shroud Images

- Red ochre paint particles are present on the linen fibers in all the image areas, but none on fibers in the non-image areas.
- Photomicrographs of image areas reveal the granular nature and identity of the pigment particles, as attested by unbiased observers who have viewed linen fibers on tape samples under the microscope (as has the author of this presentation).
- The image of Jesus on the Shroud was created by the application of red ochre (iron oxide) pigment in a protein tempera binder, both of which have been confirmed by microchemical analysis at the McCrone Laboratories.
- The image was created by an artist either by directly painting the linen or, more likely, by pressing the pigment onto linen molded onto a bas-relief carving or molding.
- The Shroud image is perfectly natural, and no supernatural event or mechanism is needed to explain it.

Formation of the Shroud Images

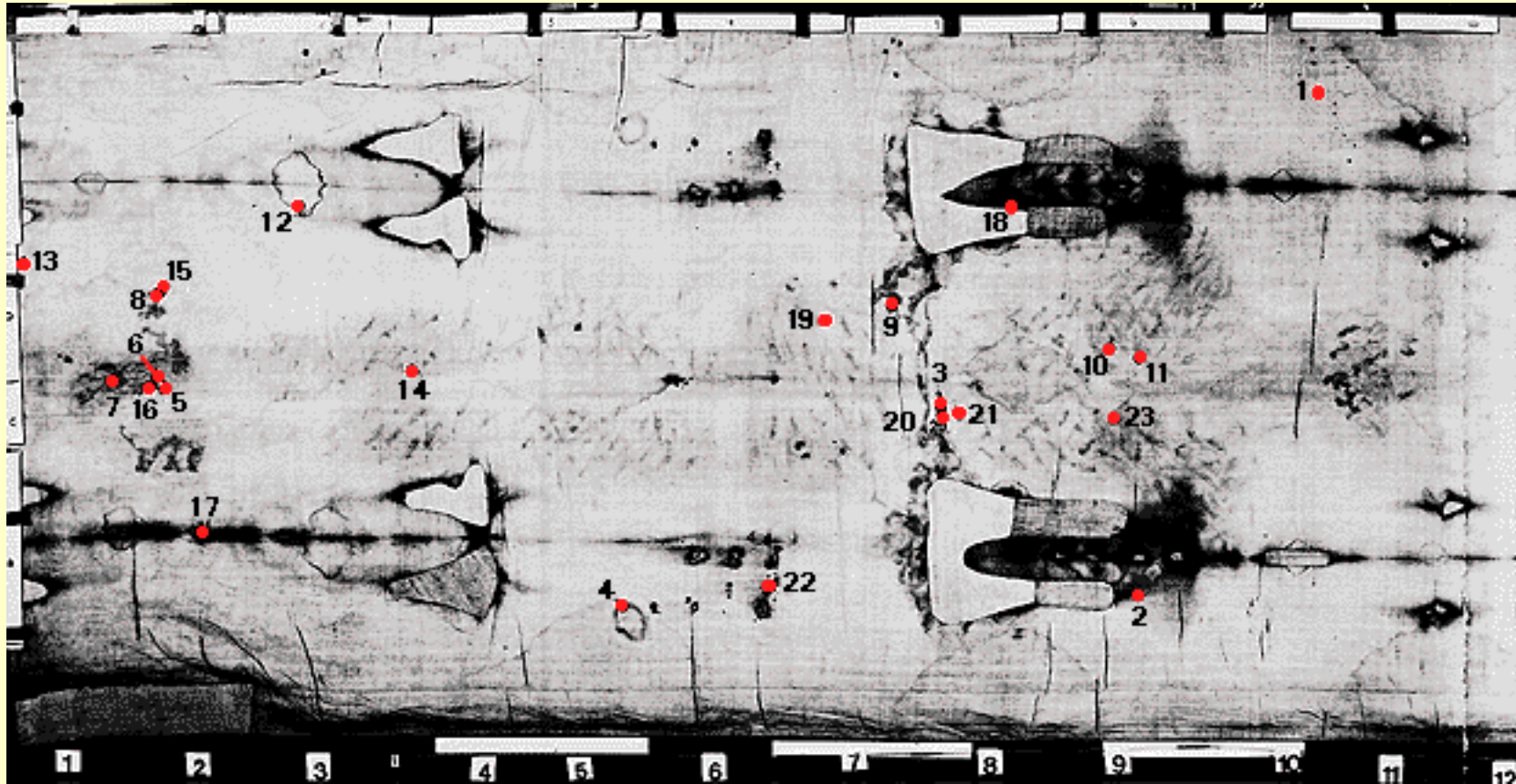


Formation of the Shroud Images



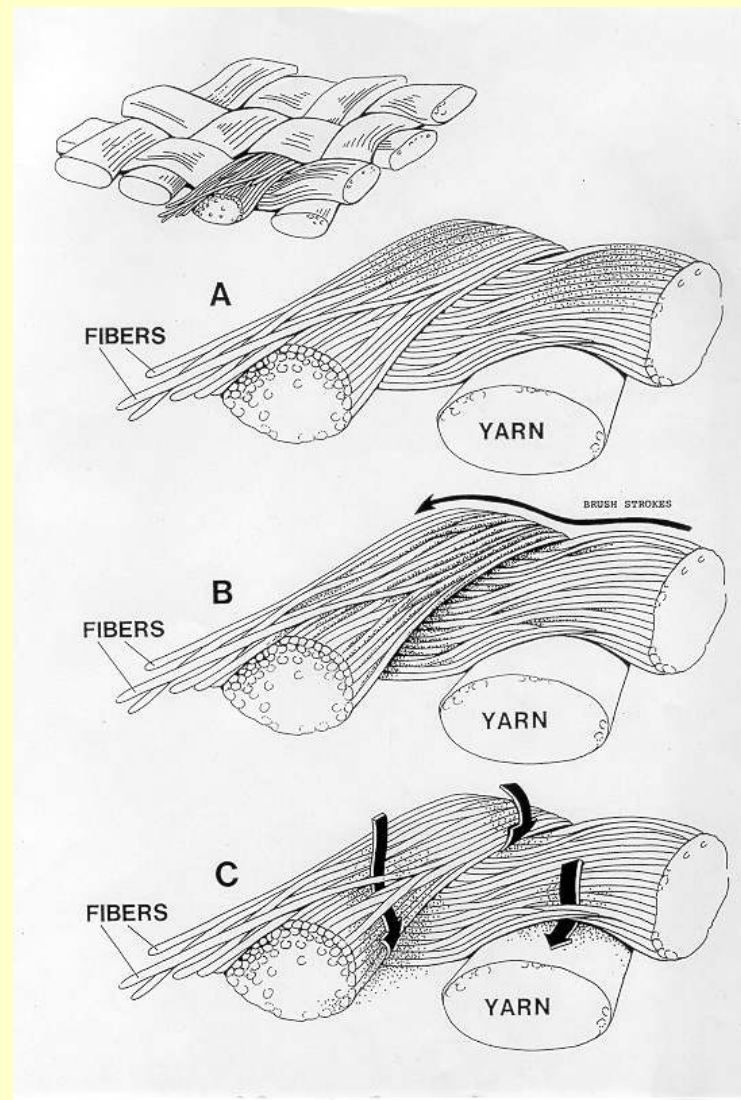
Anterior locations of photomicrographs

Formation of the Shroud Images

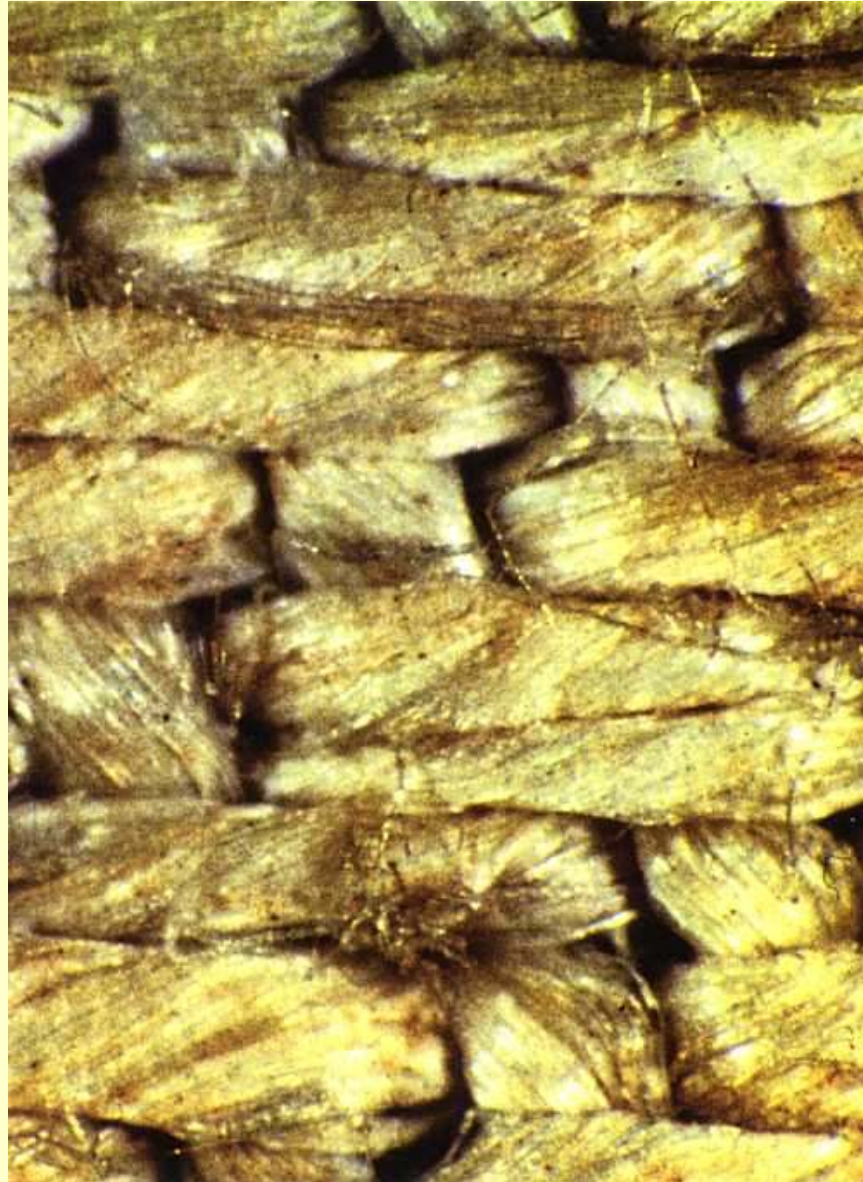


Posterior locations of photomicrographs

Formation of the Shroud Images



Formation of the Shroud Images



Formation of the Shroud Images

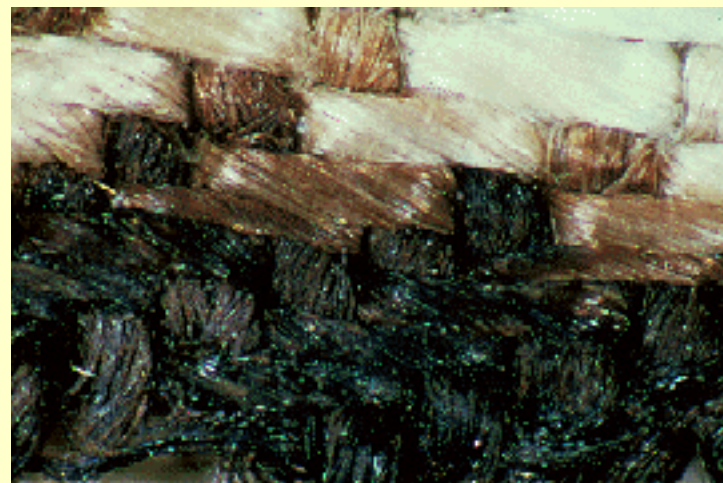
One of the front lance wounds at 3.6 x magnification showing red particulate matter in the fibrils.



The dorsal heel area at 30 x magnification.



Tip of the nose at 36 x magnification.



Formation of the Shroud Images



19



20

The photomicrographs (above) are among the most important taken during the 1978 testing. The top photo, a closeup of an image area, shows that the image is composed of tiny linen fibrils which are discolored yellow in contrast to the whiter threads of the Shroud itself. The photo beneath is taken from an area containing both bloodstains and image. These photos show that the image is superficial—that is, the yellow fibrils are on the topmost layers of the cloth. The blood seeped into the crevices of the fibers, while the image nowhere penetrated the fabric. Microscopic examination did not find any pigment on the cloth. Scientists have concluded that the Shroud image is not a painting.



“BLOOD” IMAGE, LOWER BACK 32X



RUST LEFT BY OLD TACK 32X



BURN MARK PREDATING 1532 40X

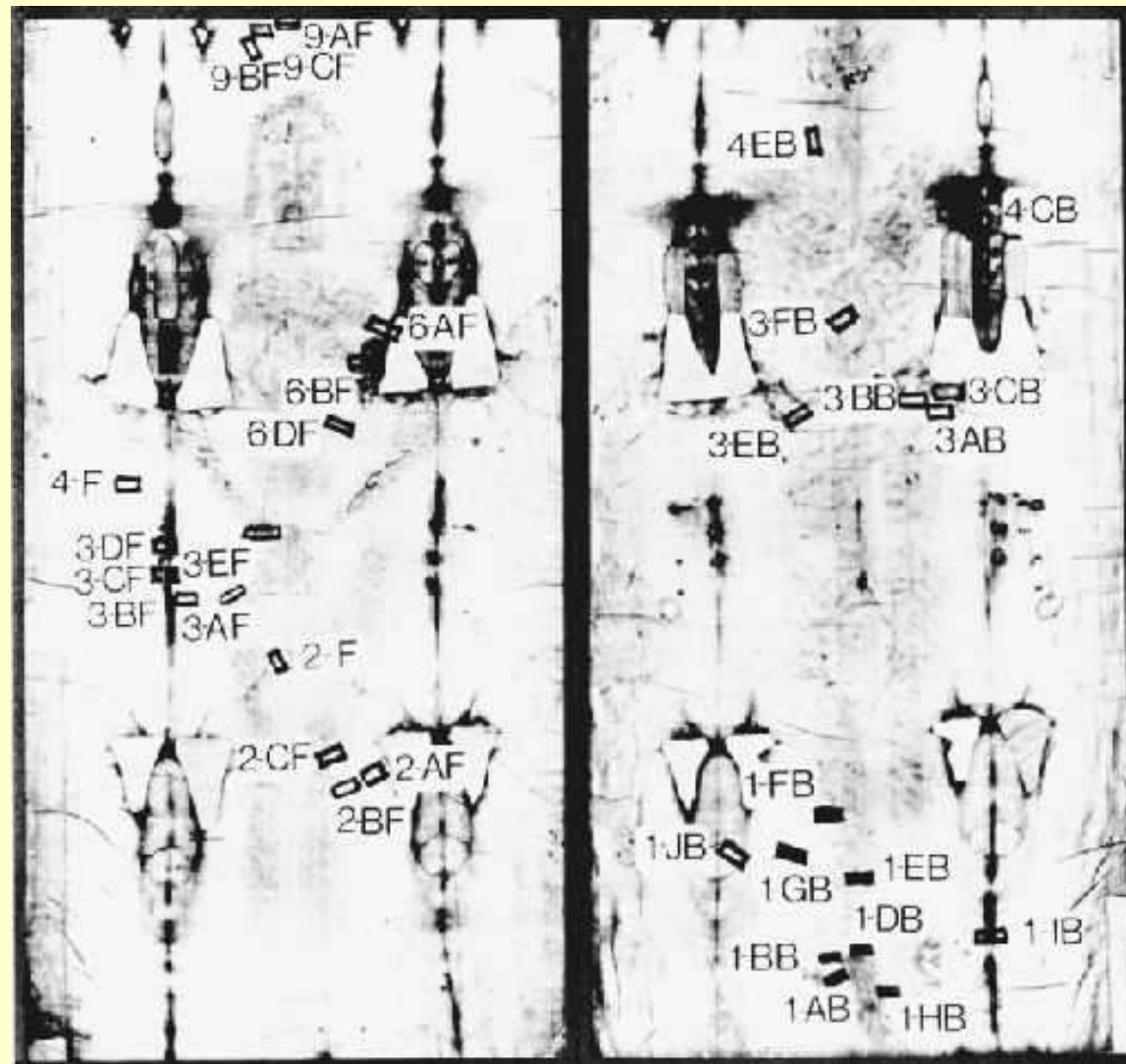


BODY IMAGE, TIP OF NOSE 40X

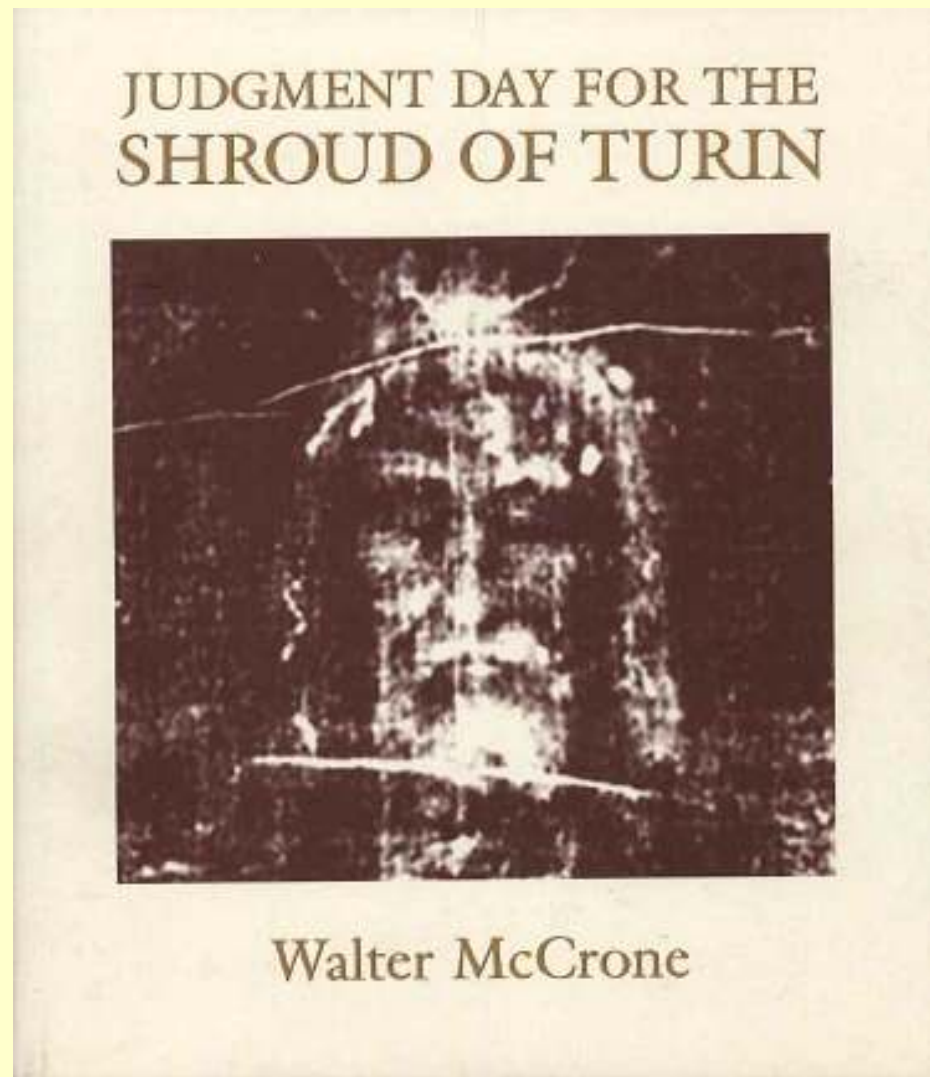
Formation of the Shroud Images



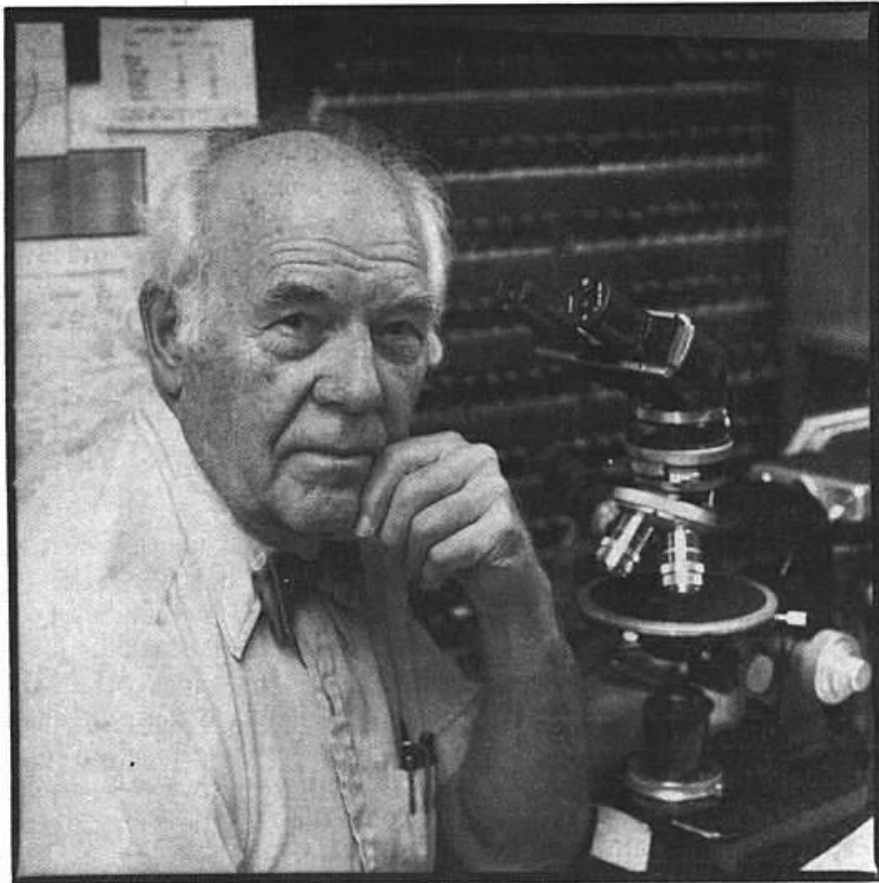
Formation of the Shroud Images



Formation of the Shroud Images



Formation of the Shroud Images



Walter McCrone, regarded by many as the world's leading micro-analyst, discovered paint pigments on the Shroud of Turin and subsequently examined pollen specimens allegedly removed from the same linen cloth. His motto is "Think small." (Photo by Joseph Barabe, copyright McCrone Scientific Photography)

*Note the polarizing microscope on Walter McCrone's desk. This is the primary instrument used by forensic and chemical microscopists to correctly identify and analyze microscopic particles. The STURP pseudoscientists have *never* used this essential instrument.*

Formation of the Shroud Images



A typical polarizing microscope belonging to the author. The circular stage rotates within the polarized light column. The first polarizing filter is in the black cylinder between the trinocular head and the turret holding the objective lenses, and the second is in the substage condenser housing. With this type of light microscope, an analyst can easily determine the refractive index, birefringence, and other diagnostic characteristics of unknown microscopic particles, thus making it easier to identify them. Shroud pseudoscientists have never used this essential type of microscope.

Formation of the Shroud Images



Alan Whanger's extremely expensive, German-made, research-quality, laboratory microscope does *not* have polarizing capability and is thus *useless* to correctly identify the pigment particles that produce the Shroud image.

Formation of the Shroud Images



Prof. Stephen Maittingly (right), head of the microbiology department at the University of Texas Health Science Center, San Antonio, Texas. He heavily criticizes the radiocarbon-dating laboratories for their failure to make a proper chemical analysis of their Shroud samples before destroying them by the

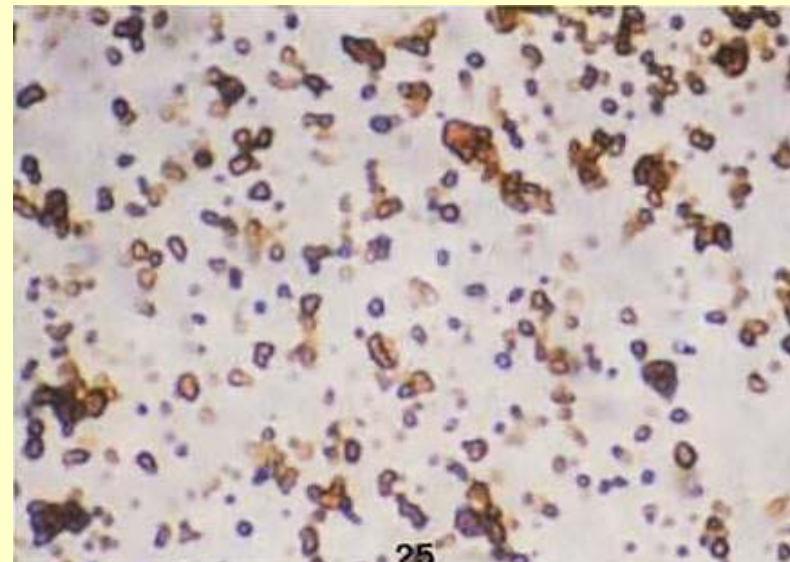
radiocarbon-dating process. Fully supportive of the 'infiltration' hypothesis of Dr Garza-Valdes (seen at left), Maittingly argues that it can only be a matter of time before the radiocarbon-dating laboratories will be obliged to admit that their 'proof' of the Shroud's medieval date was nothing of the kind.

Dr. Garza-Valdes, the “DNA of God?” author, in his lab with a standard biological lab microscope that has *no* polarizing capability and is thus incapable of correctly identifying the pigment particles that coat the Shroud linen and form its image.

Formation of the Shroud Images

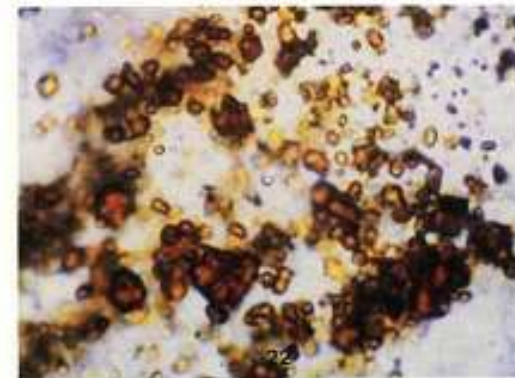
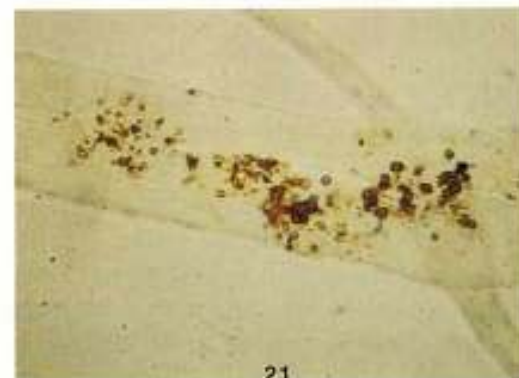
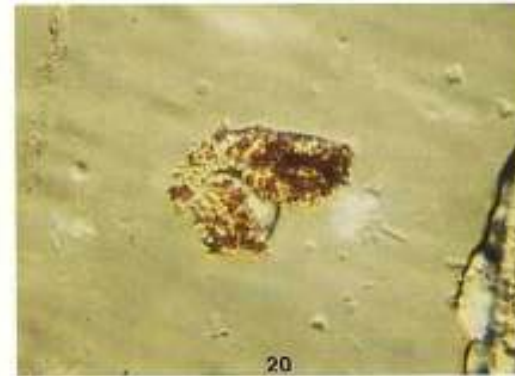
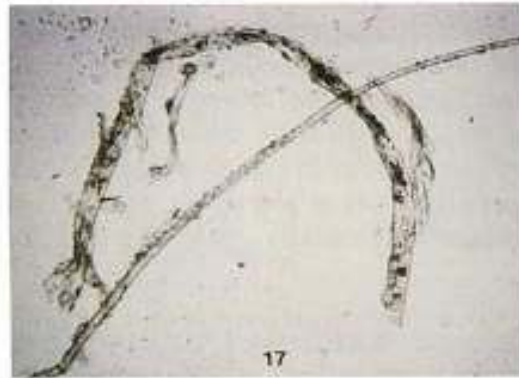


Red ochre pigment particles from the Shroud of Turin



Commercially available red ochre pigment

Formation of the Shroud Images



Formation of the Shroud Images

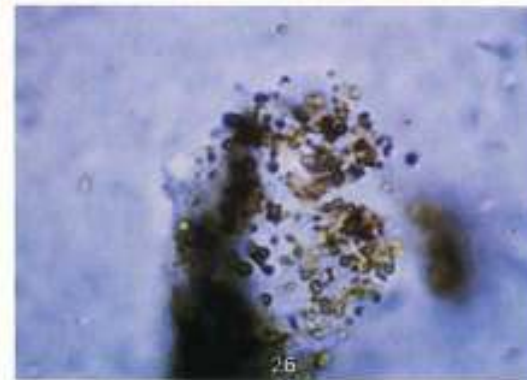
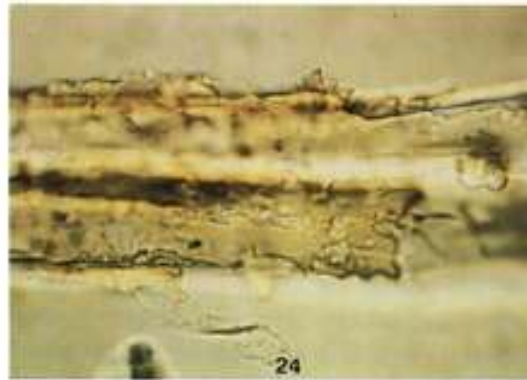
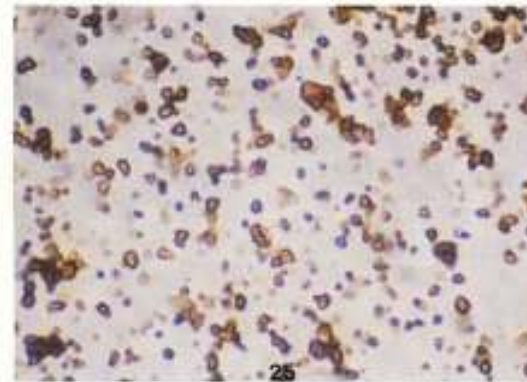


Figure 23. Real blood on a linen cloth magnified five times. Note the color compared to Figure 16 (p. 87).

Figure 24. Blood-coated linen fibers taped from the blood-painted cloth shown in Figure 23, magnified 250 times.

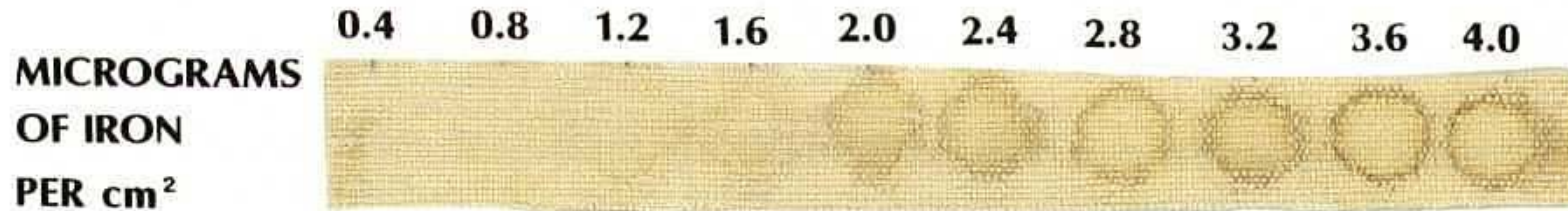
Figure 25. Morelloni Buonamici, a commercially available red ochre magnified 600 times, compare with Figures 21, 22 (p. 91).

Figure 26. Red ochre from a church wall painting in Tavant, France magnified 250 times, compare with Figures 21, 22, 25, (pp. 91, 95).

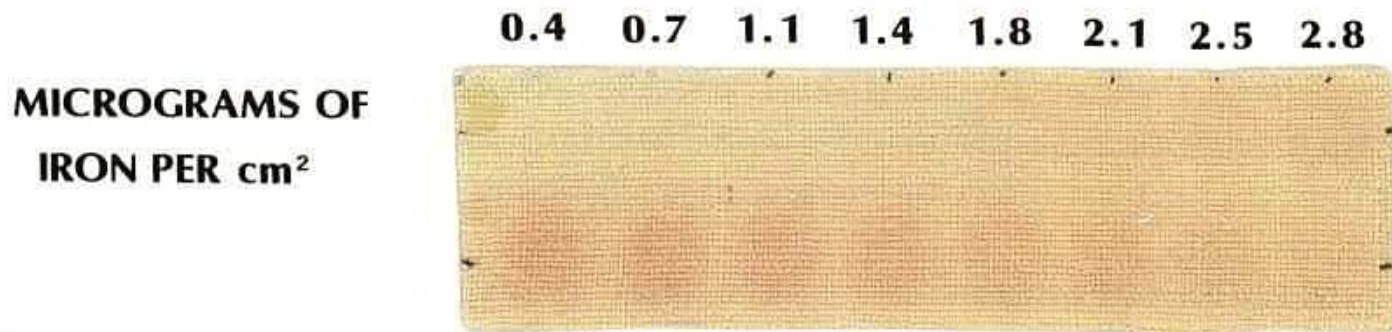
Formation of the Shroud Images

SHROUD IMAGE STUDY

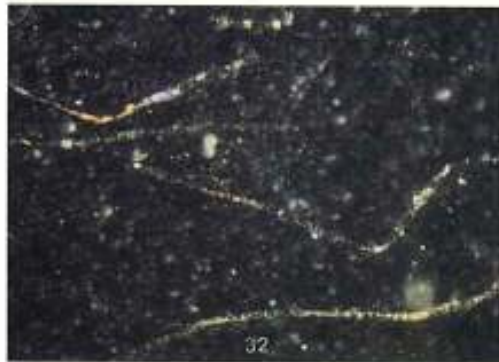
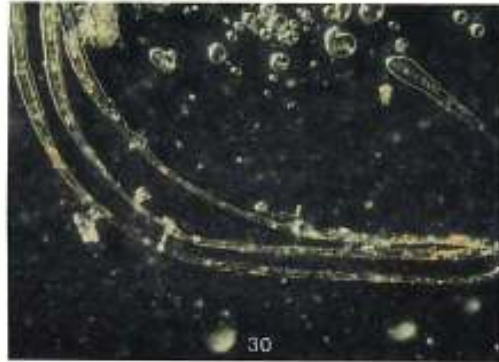
BLOOD USED AS A WATERCOLOR PAINT



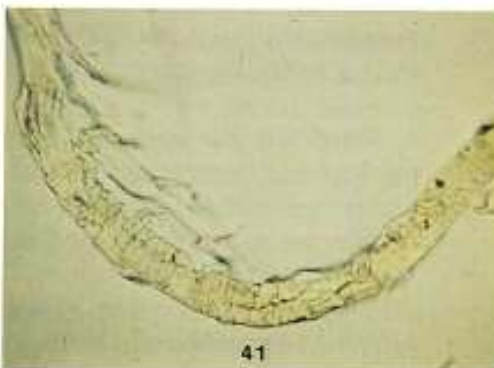
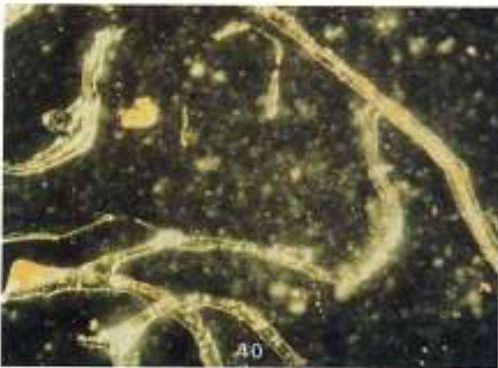
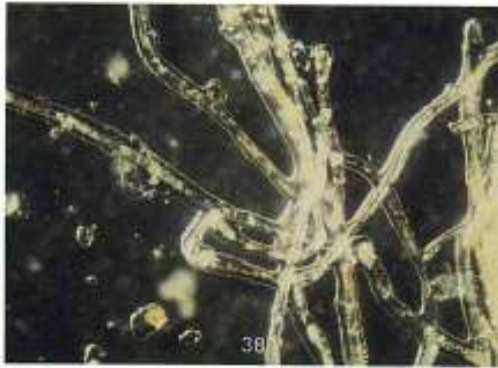
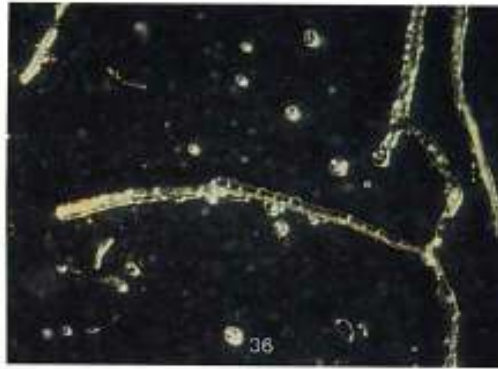
IRON-EARTH PIGMENT USED AS A WATERCOLOR PAINT



Formation of the Shroud Images



Formation of the Shroud Images



Formation of the Shroud Images

From *Judgment Day for the Shroud of Turin*, 1999, by Walter McCrone, p. 166, refuting Schwalbe and Roger, 1982, and Heller and Adler, 1981, about their mistaken identification of red ochre pigment particles as “fiber-coatings of blood,” “blood sherds,” and “blood flakes.”

These incredible suggestions show how they do struggle to avoid the obvious explanation and source of the red image—artist’s pigments.

From p. 15 of S. and R.... “In addition to Fe_2O_3 , Heller and Adler (1981) found ‘blood sherds’ and ‘blood flakes’ on many of the samples. The ‘blood flakes’ are nearly indistinguishable from the comparably-sized Fe_2O_3 particles by the usual optical techniques. However, the two materials may be differentiated by the solubility of the ‘blood flakes’ in hydrazine and the acid solution properties of Fe_2O_3 . The ‘blood sherds,’ which they found to be detached fiber-coatings of blood, are similarly distinguished from the identically appearing scorched fibrils by the ‘sherd’ solubility in hydrazine.”

This I find incomprehensible nonsense. There is a very simple optical test that differentiates blood from red ochre or vermilion—the Becke line test for refractive index. Blood in any form or any organic derivative of blood has refractive indices less than 1.60. Red ochre and vermilion have indices nearly double that of blood, or nearly 3.0. Observing such particles with magnifications of at least 500 times in a liquid having $n_D = 1.66$ differentiates instantly between these two possibilities, blood or red pigments, simply by focusing up and down. The high refractive index particles concentrate the illuminating light beam in the microscope like a lens and show a bright center as you focus above best focus. Blood or any low refractive particles show a dark center under the same focusing conditions. On examining thousands of red image particles on the Shroud tapes, I saw no low refractive index red particles except rose madder particles and a few red silk fibers (from the Shroud wrapping cloth). None of the red image-area particles are soluble in hydrazine.

Formation of the Shroud Images

I (Steven Schafersman) think it is important for me to state here that in the early 1980s, I visited Walter McCrone's laboratory in Chicago on two separate occasions. At those times, I was able to observe samples of linen fibers on sticky tape samples from the Shroud of Turin. I am a very experienced geological, biological, and micropaleontological microscopist and at that time was using a polarizing microscope almost every day for many years in my employment.

The fibers looked exactly as pictured in McCrone's book and on this website. I could clearly see the innumerable tiny red ochre pigment particles covering the fibers, and could identify them using the Becke line motion test for high refractive index. The particles were clearly composed of iron oxide, a mineral (hematite) I have identified thousands of times in my geological work. This pigment is unquestionably the source of the image and blood.

Formation of the Shroud Images



ABOVE LEFT: Replication of the Shroud face as painted for Dr Walter McCrone by professional artist Walter Sanford, with (above right) how this appears in negative, and the true Shroud negative (right) for comparison purposes.



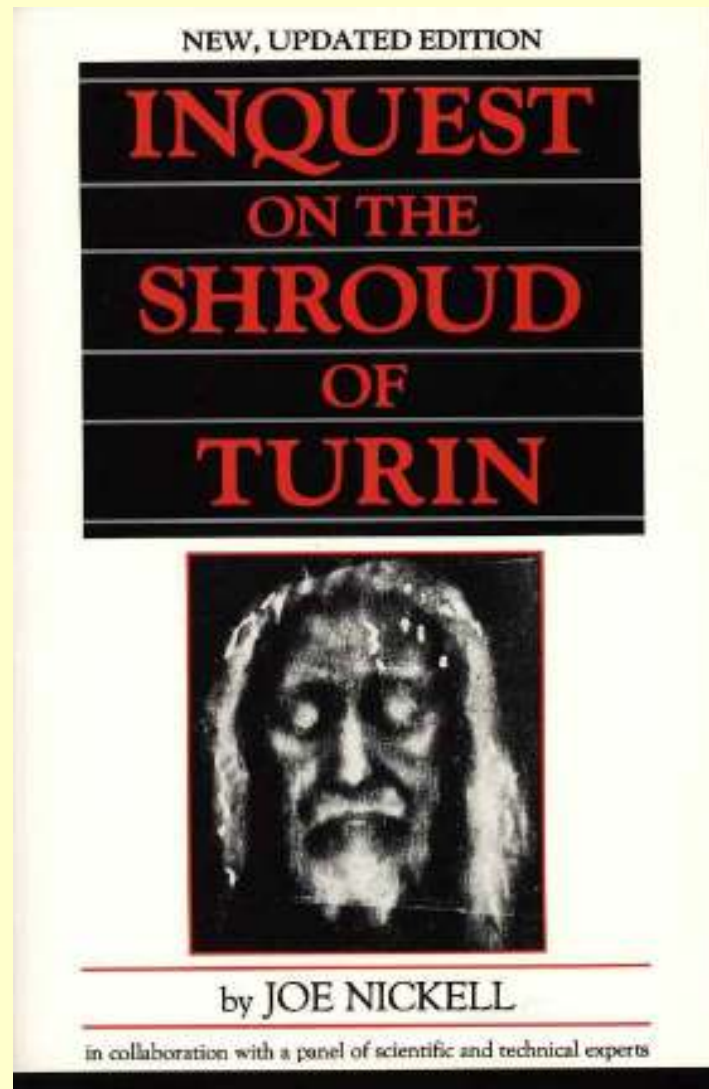
Formation of the Shroud Images



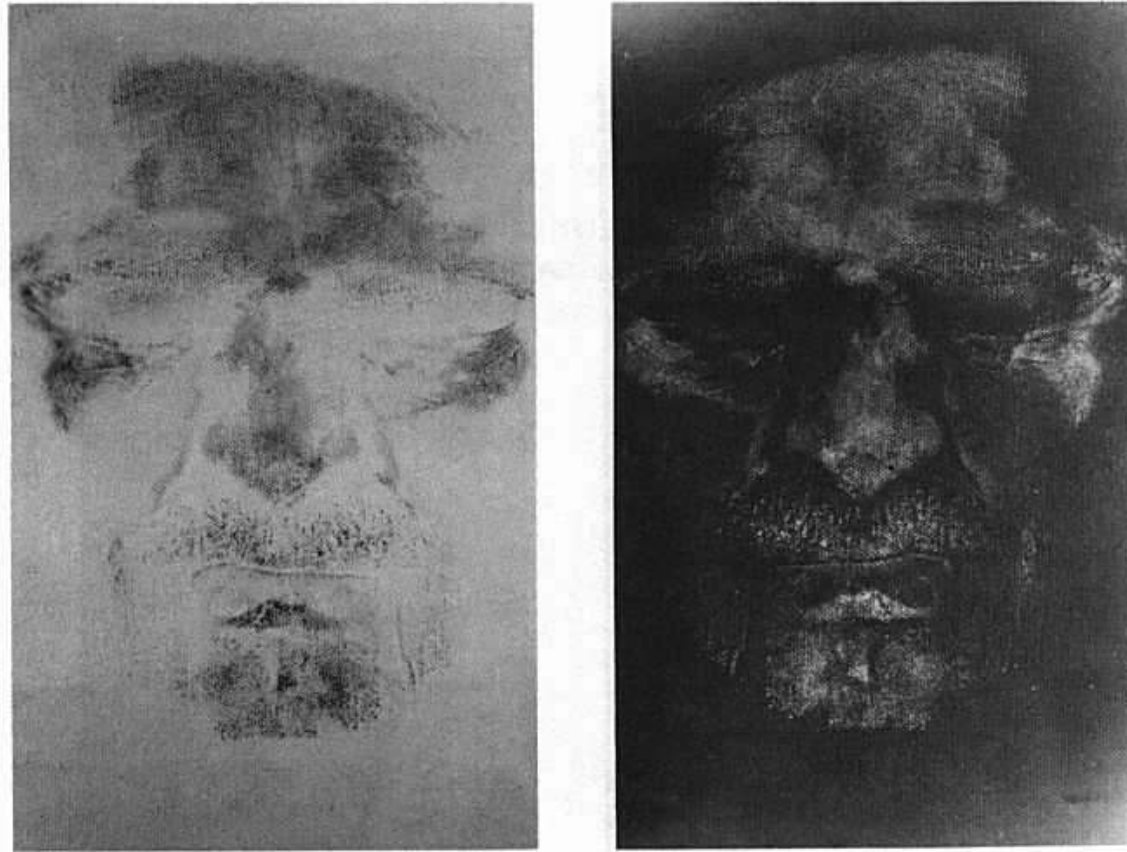
TOP LEFT: The dry powder sketch that is the starting point of the replication by Emily Craig (seen demonstrating at far right) of how the Shroud image was 'cunningly painted' by an artist.

TOP RIGHT: The image created on cloth when the original powder drawing is burnished onto it, in a dry-transfer style. The resultant image has some of the Shroud's characteristics, such as lack of outlines, but, when seen in negative (below left), clearly lacks the photographic qualities of the Shroud negative seen above.

Formation of the Shroud Images

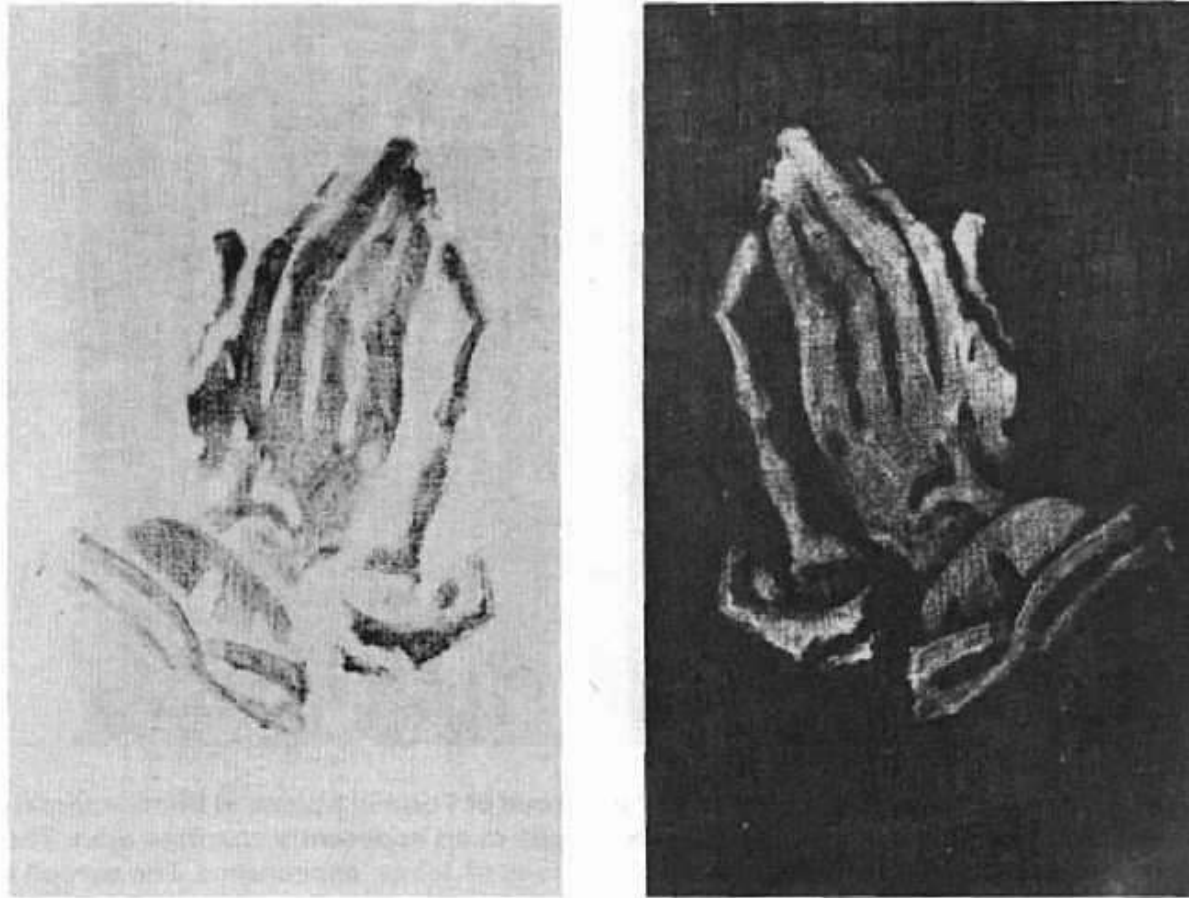


Formation of the Shroud Images



Plates 2-3. *Left:* An impression of the author's face, obtained by coating the face with a moist rouge and imprinting it on canvas stretched loosely over a frame. *Right:* A photographic negative returns a "positive" and more lifelike image. But note the serious wraparound distortions, an inevitable fact of geometry.

Formation of the Shroud Images



Plates 4-5. Positive (left) and negative (right) photographs of a *print* made by pressing cloth onto a sculpted bas-relief coated with a semimoist medium. The low relief minimizes distortions, but (unlike the shroud image) the tones are too uniform and the edges too sharp.

Formation of the Shroud Images



Plate 6. "Medieval technology" is demonstrably capable of producing shroudlike "negative" images with visually proper tonal gradations, softened edges, and minimal penetration into the fibers. *Upper left:* A suitable bas-relief is chosen. *Upper right:* Wet cloth is carefully molded to the relief; when it is dry, powdered pigment (in this instance a mixture of myrrh and aloes) is rubbed on with a cloth-over-cotton dauber. The resulting image (bottom left) becomes strikingly lifelike when it is viewed as a photographic negative (bottom right).



Plate 7. Negative photograph of the face of the shroud image.

Plate 8. Negative photograph of a rubbing image done by the author using iron oxide as the pigment. Iron oxide has been identified on the shroud image fibers.



Plate 9. Negative photograph of another rubbing image. In this instance the iron-oxide pigment was made by calcining green vitriol according to a twelfth-century recipe. The "blood" trickles were added with tempera paint.

Alleged “Blood” on the Shroud

- Contrary to the claims of Shroud authenticity advocates, there is *no* blood on the Shroud of Turin.
- All competent, properly-conducted microanalytical tests for blood or hemoglobin on the Shroud have been *negative*.
- There have been positive tests for iron, protein, albumin, and serum, but these are not conclusive for true blood, and there are good explanations for the presence of these on the Shroud in the red ochre pigment and proteinaceous tempera binder.
- The “blood” on the Shroud consists of two major pigments, vermilion (cinnabar, HgS) and red ochre (hematite, Fe₂O₃), that were painted on by an artist using a brush, thereby forming the perfect droplets and rivulets of blood, which are completely unrealistic.

Alleged “Blood” on the Shroud



Photomicrograph of “blood” coating a blood area on the Shroud. Actually, it is a mixture of vermilion and red ochre pigment. Note the intense red color and particulate nature of the pigment.

Alleged “Blood” on the Shroud



Red ochre particles coating “blood”-image area fibers on the Shroud.



A photomicrograph of a “blood”-image area on the Shroud.

Alleged “Blood” on the Shroud



Real blood-coated linen fibers from the cloth at right.



Real blood coating fibers on linen cloth. Note the dark color of the dried blood.

Alleged “Blood” on the Shroud

The protein that coats Shroud image fibers could be blood or egg, cheese, or collagen tempera binder. Only collagen (made from boiling parchment scraps) contains no cystine or cysteine, amino acids that contain sulfur. Compounds containing sulfur will catalyze the decomposition of sodium azide in an aqueous solution to emit nitrogen gas. Real blood, egg and cheese tempera produce a vigorous effervescence of nitrogen; collagen will not.

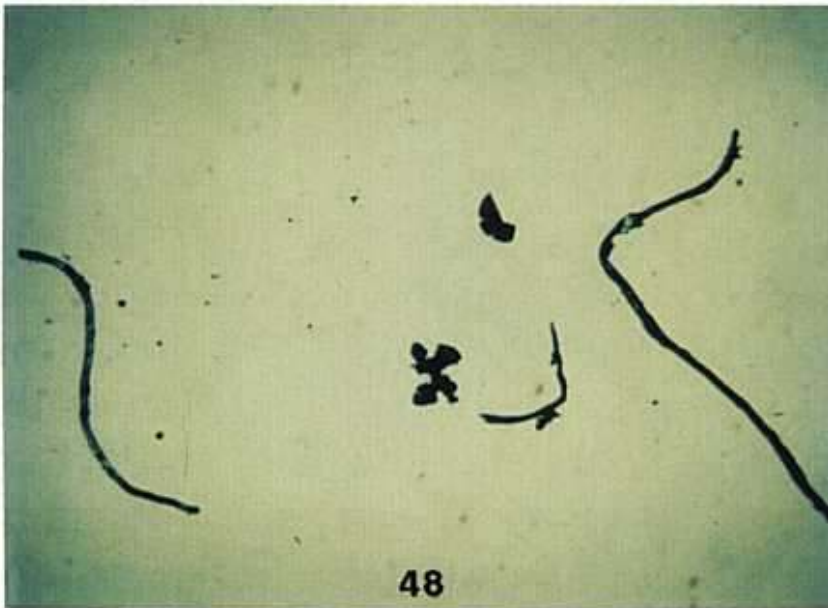


Figure 48. A Shroud “blood” fiber on the left. Real blood particles and real blood-coated fibers on the right. Viewed dry. 20X

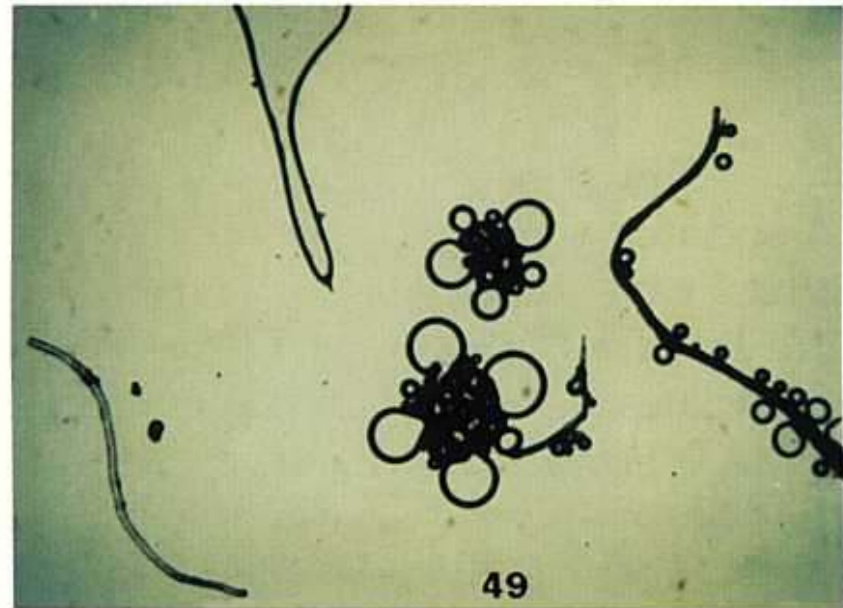


Figure 49. After applying an aqueous sodium azide solution, the sulfur-containing blood and blood-coated fibers produce nitrogen, while the Shroud “blood” fiber emits none.

Alleged “Blood” on the Shroud

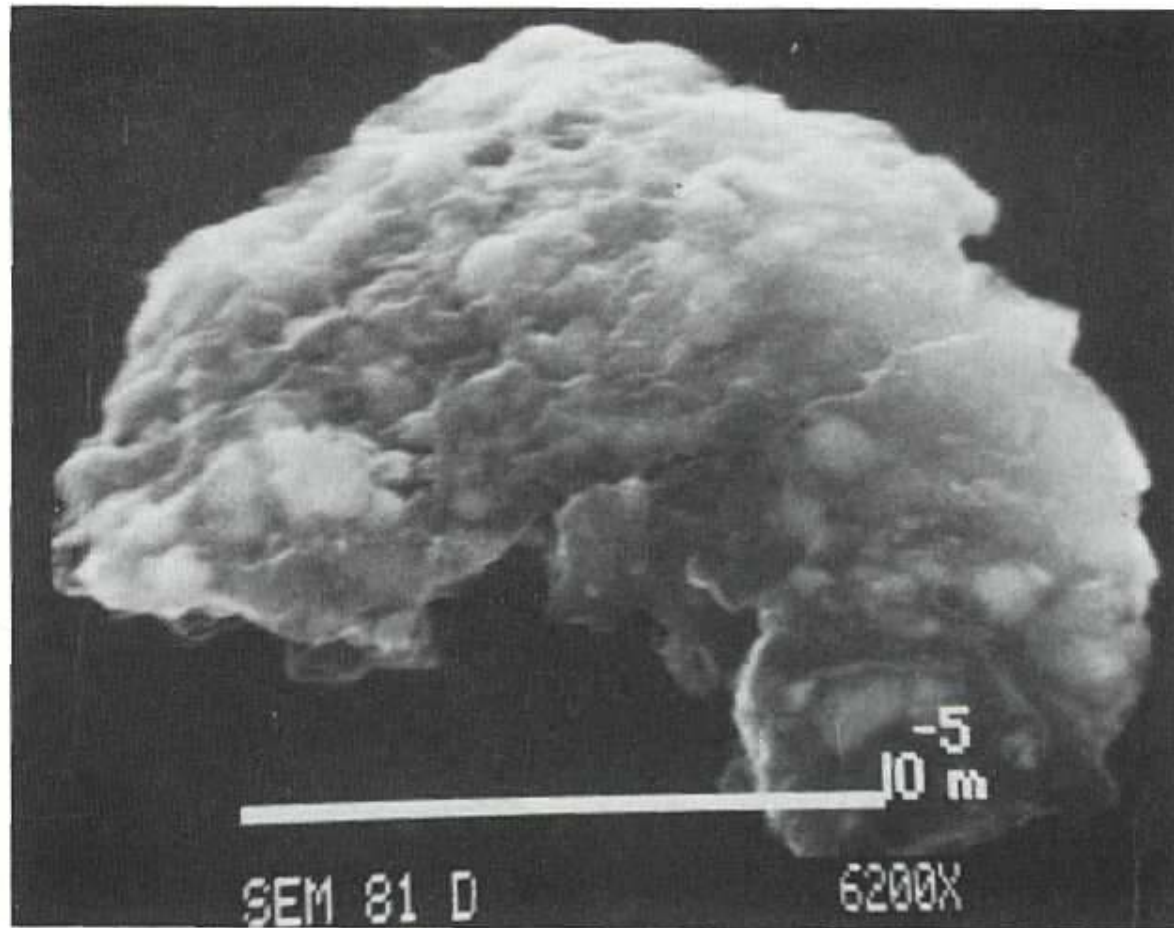


Figure 54. An electron micrograph (SEM) of a pigment/medium agglomerate D (PMA-D) from a blood-image area of the “Shroud” enlarged 6200 times.

Alleged “Blood” on the Shroud



Figure 55. The corresponding iron map of a “Shroud” pigment/medium agglomerate (PMA) particle D in Figure 54 showing the locations of red ochre.

Alleged “Blood” on the Shroud

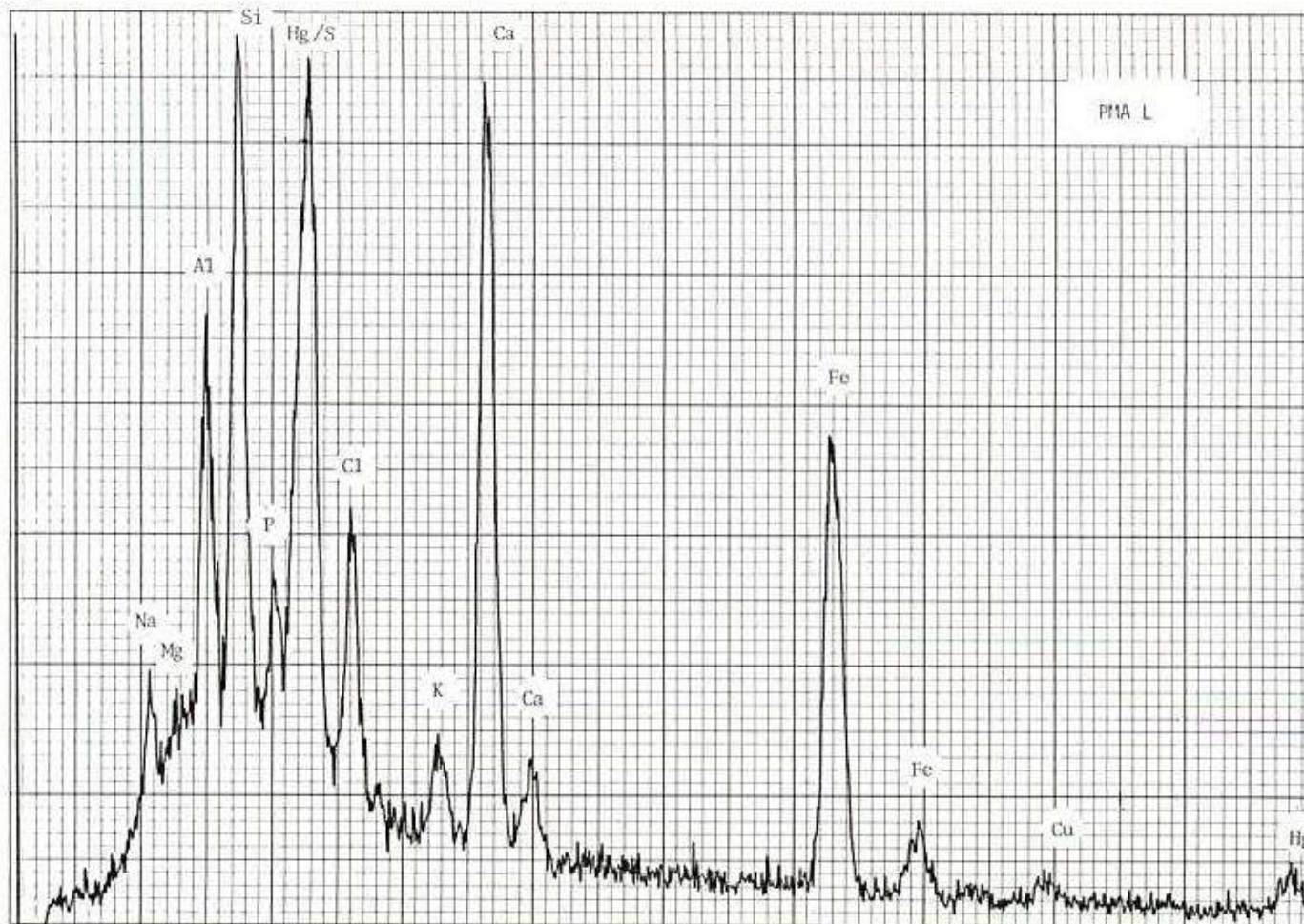


Figure 56. A complete elemental analysis of another “Shroud” PMA particle (L). The iron (Fe) peaks are red ochre, the mercury/sulfur Hg/S peak is vermilion.

Alleged “Blood” on the Shroud

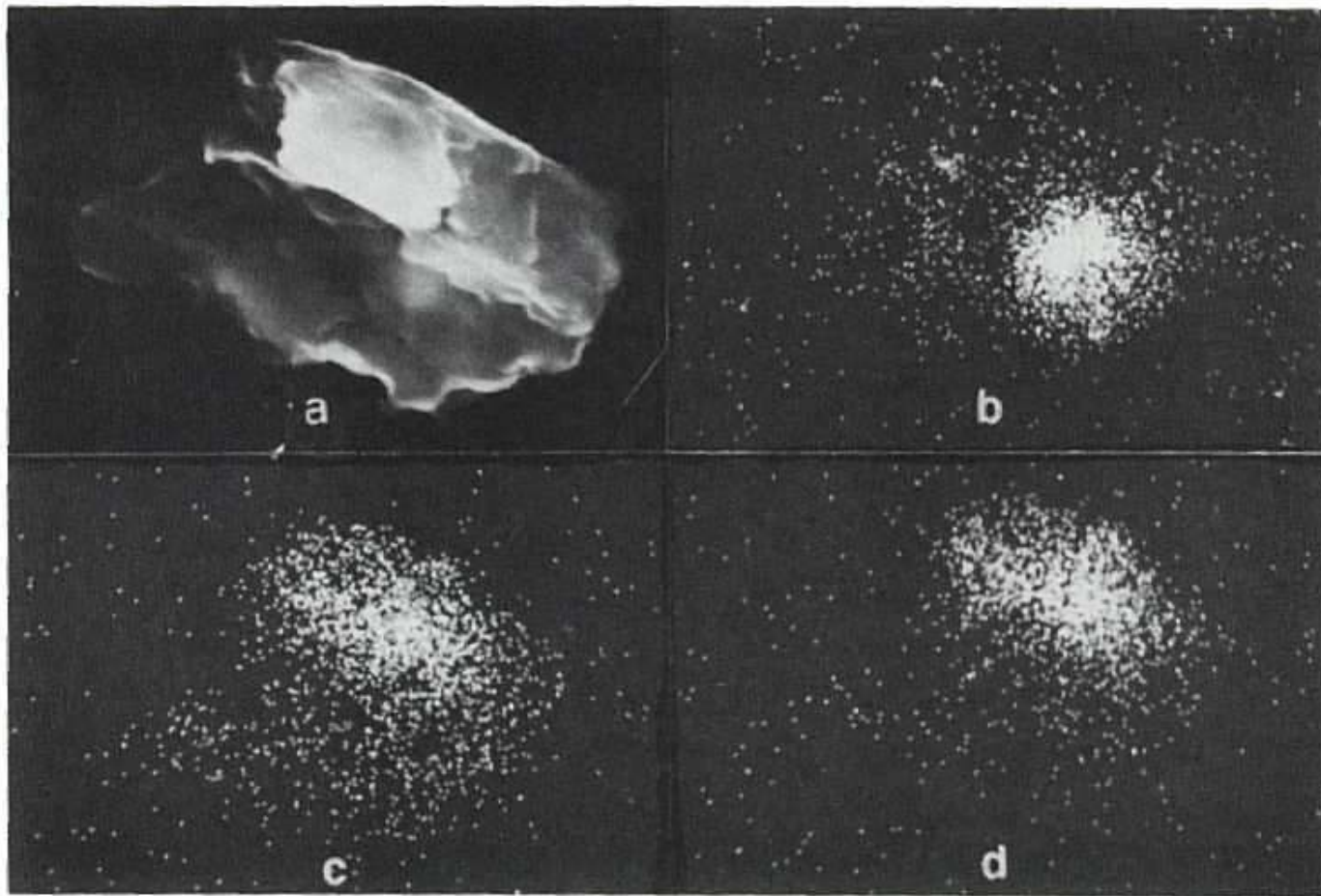


Figure 57. The electron micrograph (with back-scattered electrons of the scanning electron microscope) of PMA H, (a) is shown here with the energy dispersive X-ray maps for iron (b), mercury (c), and sulfur (d) magnified 2500 times.

Alleged “Blood” on the Shroud

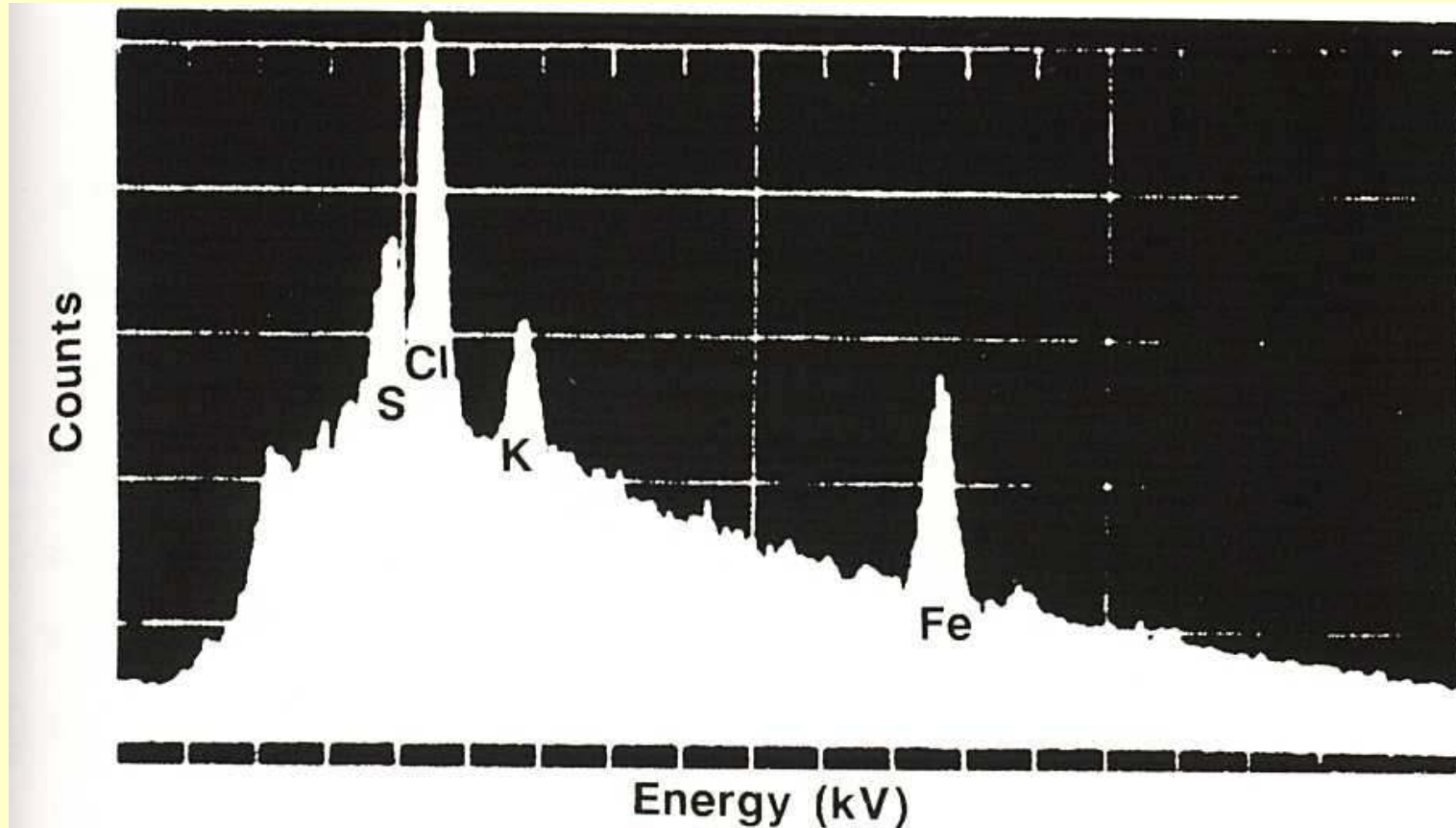


Figure 65. The elemental analysis by energy dispersive X-ray analysis (EDX) of real blood taken from The Particle Atlas (McCrone 1973 or 1992). The important blood peaks are labeled.

Note the high amounts of potassium (K) and chlorine (Cl) in real blood in addition to iron (Fe) and sulfur (S).

Alleged “Blood” on the Shroud

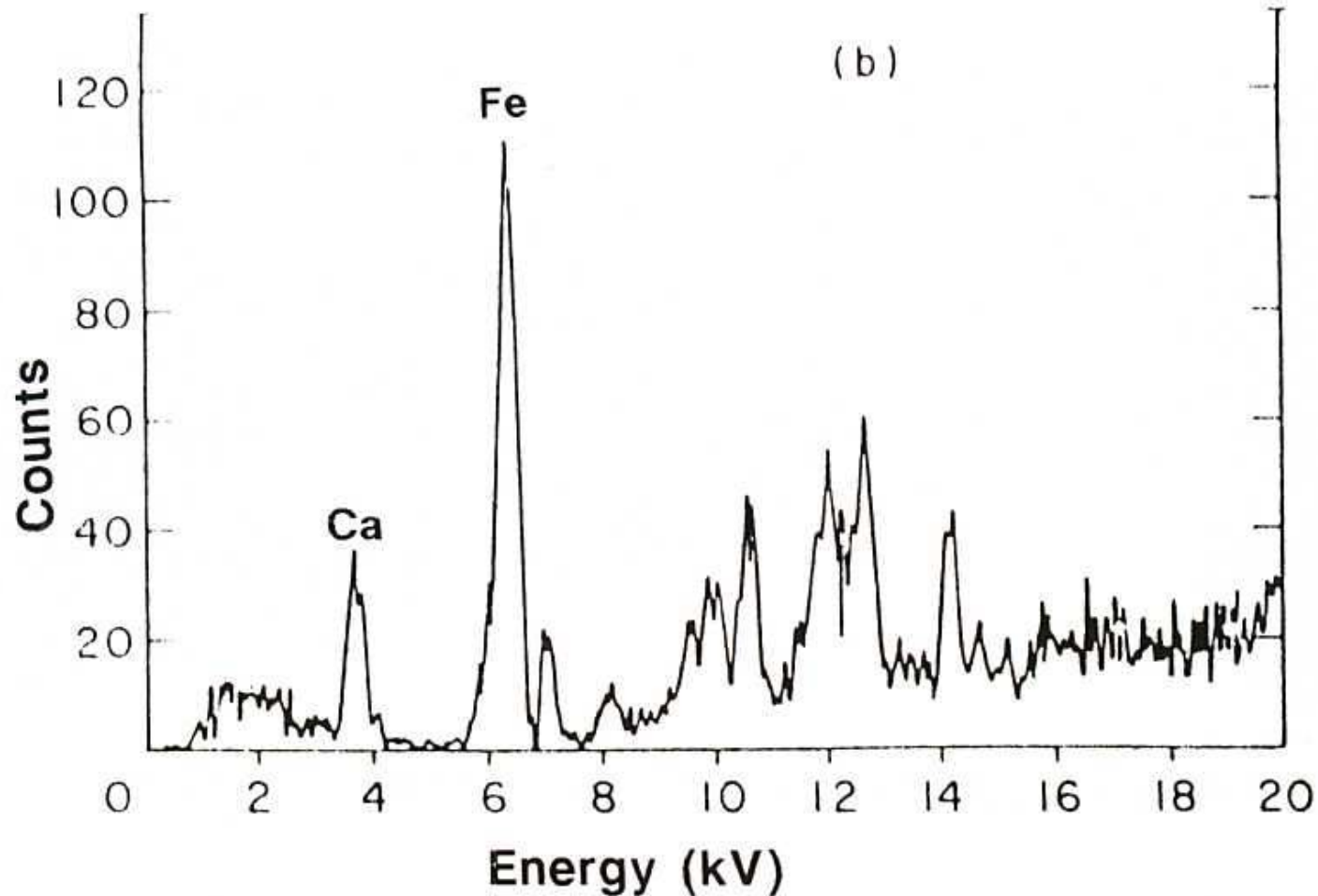
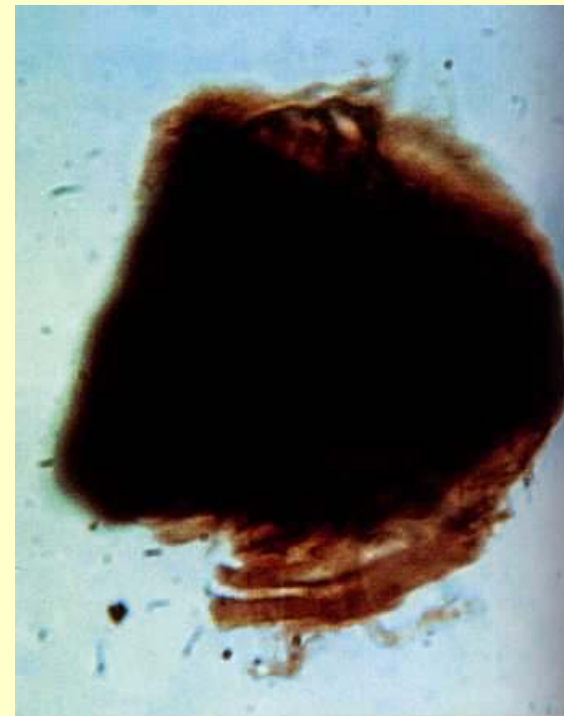


Figure 66. An X-ray fluorescence elemental analysis (Morris, Schwalbe, and London, 1980) from the side wound blood-image. The intense red ochre iron peaks are indicated. The essential potassium and chlorine peaks are absent. The calcium peak is much too high relative to the iron peak to indicate blood. Reprinted with permission.

Alleged “Blood” on the Shroud



ABOVE: *Seen at centre, Jewish-born Dr Alan Adler, a world authority on blood chemistry, at work on Shroud 'blood' samples. From eleven independent scientific tests, he is in no doubt that the samples are human blood.*



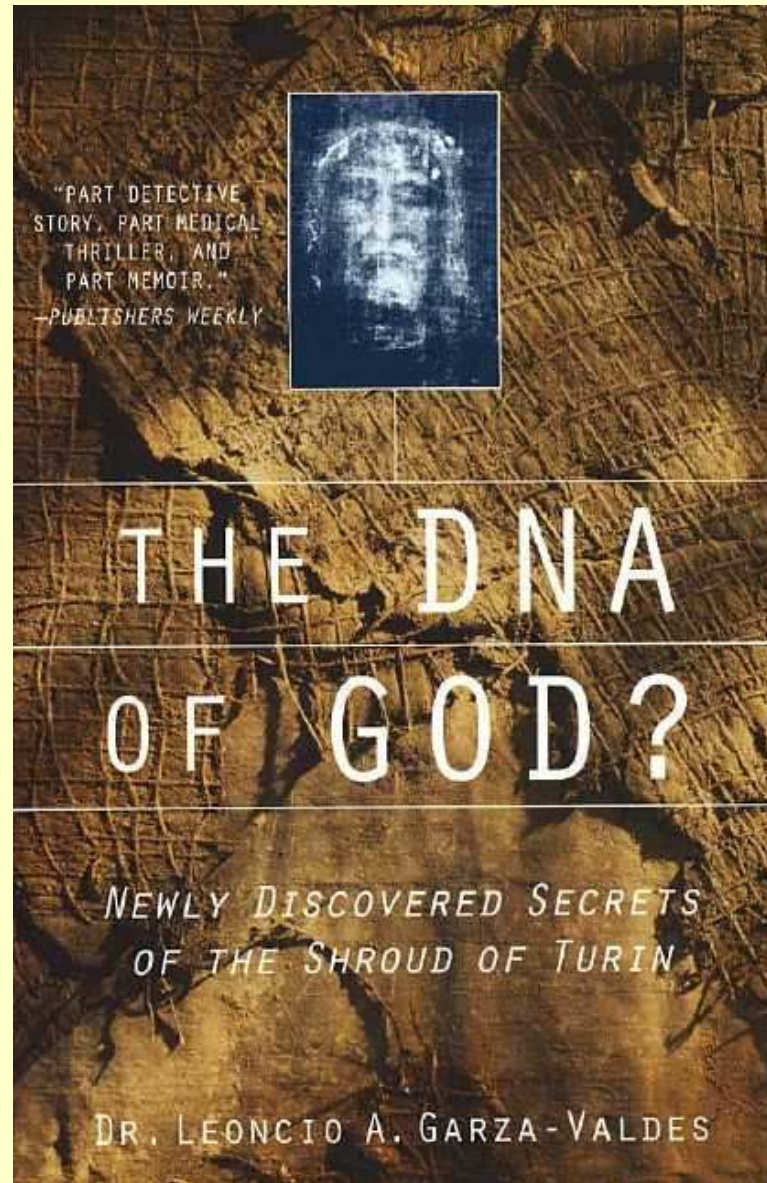
ABOVE: *Found on a sticky-tape taken from the region of the small-of-the-back bloodstains, what some suggest to be a muscle fragment, possibly removed during the scourging.*

Both photos from a pro-authenticity Shroud book.

Bioplastic Coating and the “DNA of God?”

- There is no “bioplastic coating” on fibers of the Shroud of Turin. The “acrylic-polymer coating” that Garza-Valdes claims to see is actually the natural luster of the linen fibers.
- The samples obtained by Garza-Valdes for his study were from a non-image and non-blood area, so his claim to see “blood” of any type here is due to his imagination.
- For the “bioplastic coating” to affect the radiocarbon date, the mass of the coating would have to be twice the mass of the fibers, *and* the coating would have to be modern.
- Since there is no real blood on the Shroud, there is no DNA from the “blood.” The DNA Garza-Valdes claimed to detect was from human skin-cell contamination magnified millions of times by PCR, a common problem caused by sloppy laboratory technique.

Bioplastic Coating and the “DNA of God?”



Bioplastic Coating and the “DNA of God?”

*How radiocarbon-dating may have seriously mis-dated the Shroud?
The theory of American microbiologist Dr. Leoncio Garza-Valdés*



48a. The 'fake' that was not a fake. The Mayan carving known as the Itzamma Tatl. A bacterial build-up, forming a shiny bioplastic coating, caused 'experts' seriously to mis-date this.



48b. Dr. Leoncio Garza-Valdés (left) at his microscope. He wondered whether a similar bioplastic coating might have radically falsified the so-confident '1260-1390' radiocarbon-date attributed to the Shroud.

48c. Photomicrograph of a Shroud thread cut transversally, showing the fibres encased in a bioplastic material built up by millions of bacterial micro-organisms in the manner of a mold reef. According to Dr. Garza-Valdés, the proportion of this still living material relative to pure Shroud linen could readily account for a 1,300 year error.



Bioplastic Coating and the “DNA of God?”



This is a photo of Garza-Valdes's Maya *tun*, on which he claimed to discover a bioplastic coating which gave it a young age. This gave him the idea that the Shroud of Turin also has a bioplastic coating. In fact, this *tun* is a modern forgery sold to him by a Mexican con artist. Soil was rubbed into its surface to give it an ancient appearance.

Bioplastic Coating and the “DNA of God?”



Photomicrograph of Shroud of Turin sample showing the naturally plasticized textile.

Bioplastic Coating and the “DNA of God?”



Scanning electron microscopy photomicrograph of Shroud's non-image fibers, showing the acrylic-polymer coating.

Bioplastic Coating and the “DNA of God?”

A close-up

A high-magnification view shows the coating on a fiber from the Shroud of Turin. Using a microtome, an instrument used to cut microscopic samples, Health Science Center researchers were able to show the buildup of fungi and bacteria on the fiber. The purplish hues are from Gram's stain, which highlights microbial growth.

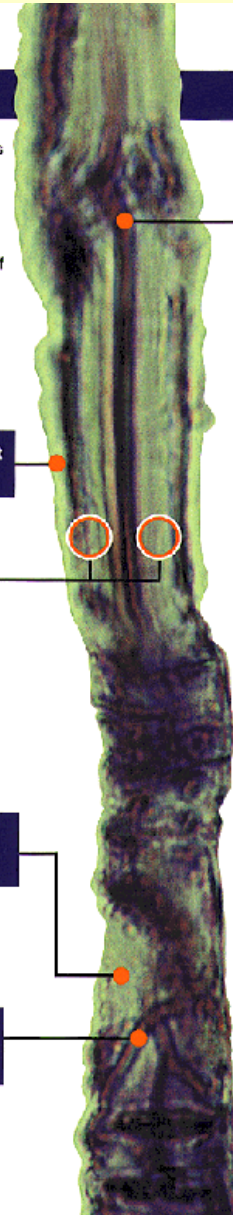
Lumen, the hollow center of the flax fiber

Bioplastic coating, a byproduct of fungi and bacteria

Fiber

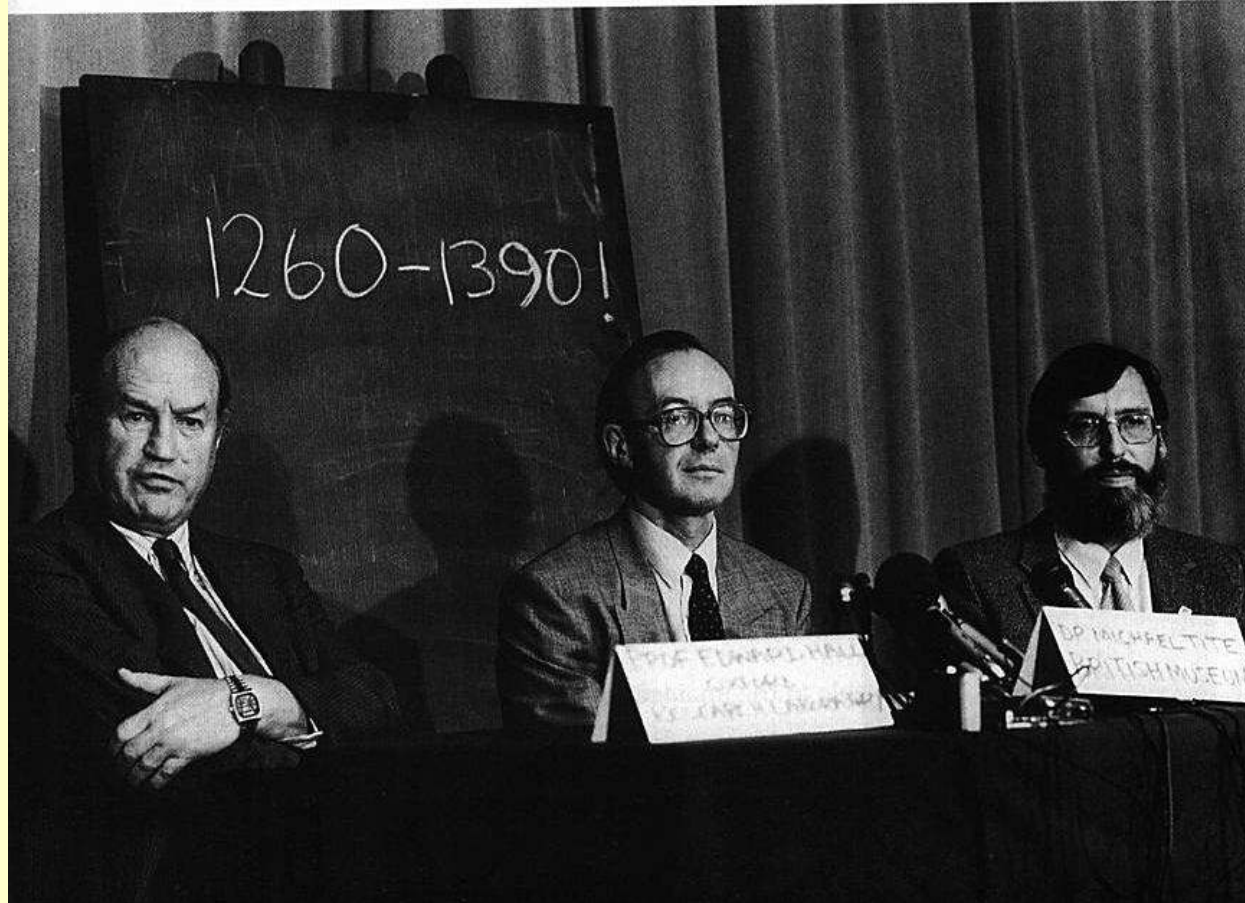
Deposit of polymers from the fungi and bacteria

Filamentous bacteria, a snake-like growth

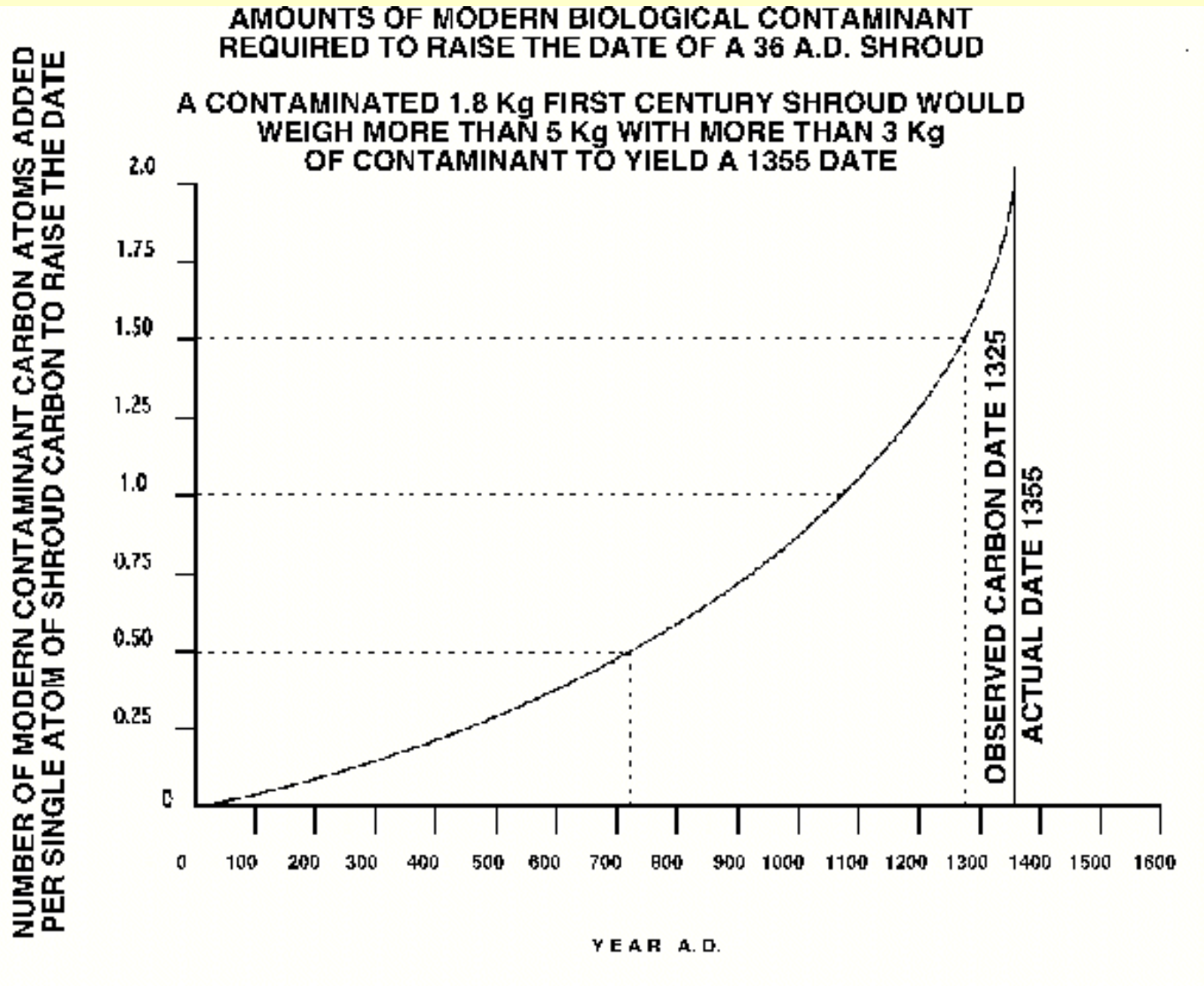


Bioplastic Coating and the “DNA of God?”

3b. British scientists Professor Edward Hall, Dr. Michael Tite and Dr. Robert Hedges announcing the results of the carbon-dating at a press conference held at the British Museum 13 October 1988.



Bioplastic Coating and the “DNA of God?”



Palestinian Pollen and Plants on the Shroud

- The most credulous claim about the Shroud of Turin is that pollen grains from dozens of plants native to Palestine and Turkey are on the cloth. This is completely untrue, and the claim is the result of a deliberate and fraudulent scheme by the late Max Frei.
- For several reasons, the pollen that Max Frei claimed to find on his sticky tape samples could not have been honestly collected from the Shroud cloth.
- Evidence suggests that Max Frei spiked the tape samples as they were being taken from the Shroud and placed on microscope slides.
- Images of Palestinian plants that Alan Whanger claims to see on the Shroud cloth are a product of his imagination.

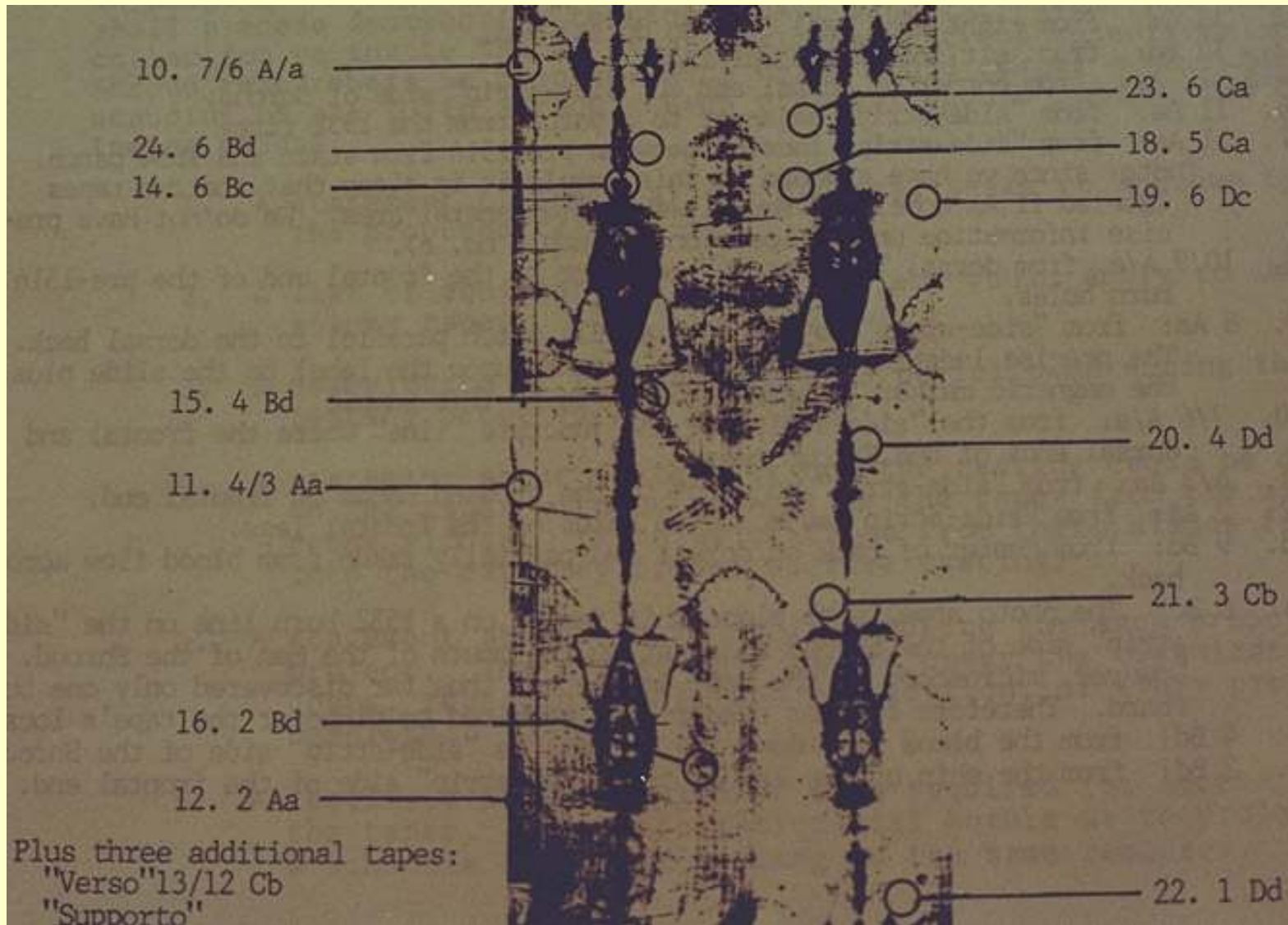
Palestinian Pollen and Plants on the Shroud

- Max Frei claimed to identify 49 (later increased to 56) species of plant pollen on his Shroud tape samples. Over 300 pollen grains were found on Frei's tapes, while STURP's tape samples revealed a single pollen grain.
- It is not possible to identify most pollen to species as did Max Frei, but only to family and possibly genus.
- Frei collected pollen from travels to Israel, Palestine, and Turkey, using these to illustrate his papers.
- Half of the species that Frei names are entomophilous, pollinated by insects, and their pollen does not leave the flowers propelled by the wind.
- Such pollen also does not normally fall out of the flowers when cut and placed on a shroud. Pollen extraction requires deliberate insect (or human!) activity!

Palestinian Pollen and Plants on the Shroud

- Most of the species Frei identified are xerophytes and halophytes, many of which do not have the types of flowers one brings to the graveyard to place on shrouds.
- One of Frei's tape samples, 6B/d, held 107 of the 313 pollen grains found by Danin et al. The pollens were on the lead of the tape, the part touched by the hand, and were mixed together with cotton fibers from Frei's glove!
- All the reliable scientific evidence proves the Shroud is an artifact created by an artist in Gothic France in the early fourteenth century, and the Shroud has never left Europe throughout its history, so Frei's results are bogus.
- Max Frei has been shown in other ways to be dishonest and incompetent, and his fabrication of false pollen evidence is only the last episode in his clumsy efforts to deceive others.

Palestinian Pollen and Plants on the Shroud



Palestinian Pollen and Plants on the Shroud



Microscopic clues cling to tape applied to the shroud by Swiss criminologist Max Frei. Samples taken by Frei during a 1973 examination held pollen from plants native to the Palestine area, which some cite as evidence that the shroud was once in the Middle East. But the relic was sometimes displayed unprotected, and far-ranging airborne pollen could have easily collected.

Chemist Ray Rogers, left, took 36 tape samples for the American team. Researching textile history, Rogers uncovered the ancient practice of washing cloth in detergent made from a soapwort, *Saponaria officinalis*. Experiments show that saponaria-treated linen scorches more easily. *Saponaria* is a known fungicide, which may explain why the shroud has no obvious mold or mildew.

Palestinian Pollen and Plants on the Shroud

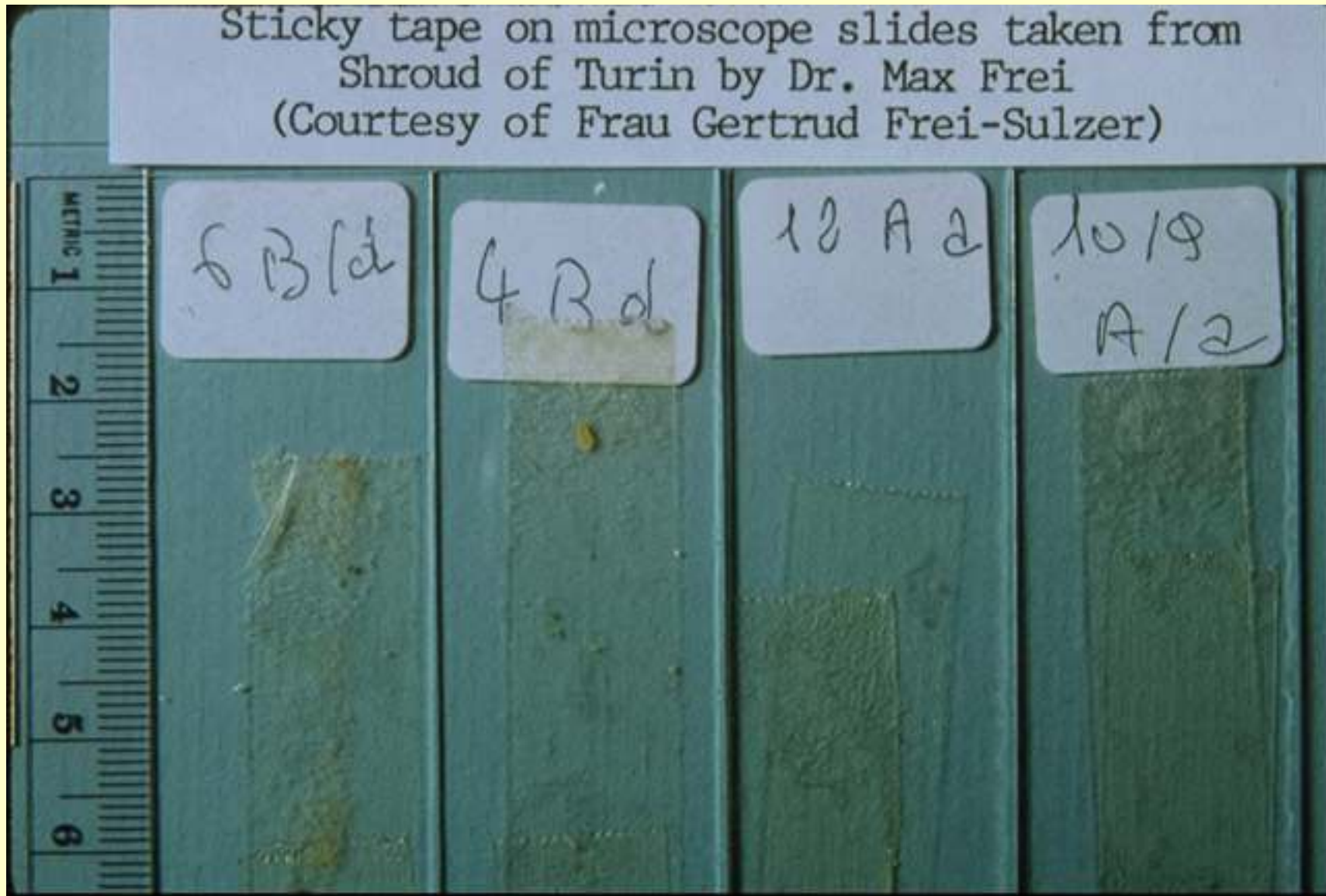


This famous photo shows Max Frei (left) arguing with John Jackson (right), while Luigi Gonella mediates. Jackson correctly objected to Frei's unscientific use of a plastic tape dispenser to take his particle samples off the Shroud image! Note the white cotton gloves that researchers wore to protect the Shroud. Also note the cross hanging from Jackson's neck!

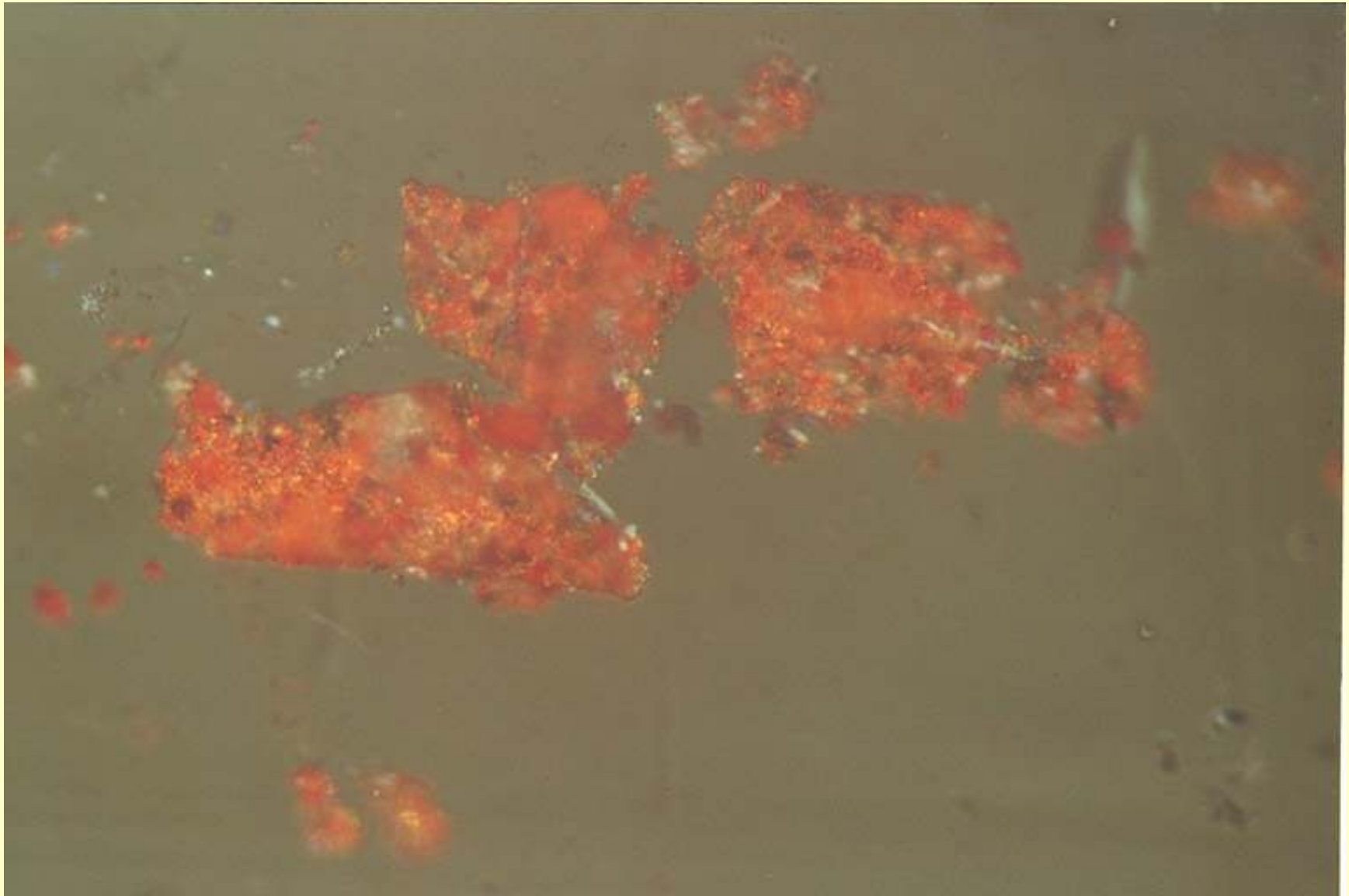
Palestinian Pollen and Plants on the Shroud



Palestinian Pollen and Plants on the Shroud



Palestinian Pollen and Plants on the Shroud



Palestinian Pollen and Plants on the Shroud



Palestinian Pollen and Plants on the Shroud



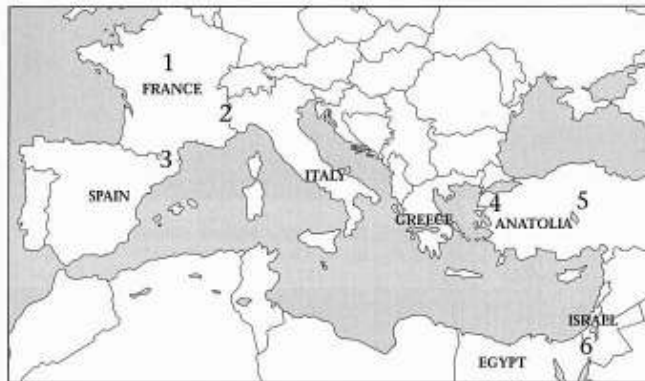
1. *Coryllus Avellana* L.
(Hazel)
To be found throughout
France, Italy, and elsewhere.



2. *Althea Officinalis* Marsh
Halophyte plant widespread
around Mediterranean area.



3. *Philyrea Angus Tifolia*
Plant of the general
Mediterranean region.



4. *Pteranthus Dichotomus*
Forsk
Plant of the sandy and
limey desert, particularly
Anatolian steppe and
Jerusalem environs.



5. *Haplophyllum*
Tuberculatum Juss
Plant of deserts, particularly
Anatolia and Jerusalem envi-
rons.



6. *Prosopis Farcta* Machr
Plant to be found in
Anatolia but particularly
common around Dead Sea.

29. Some examples of the 58 different varieties of pollens that Dr. Max Frei found among the Shroud's surface dust, as identified by him up to the time of his death in 1983, with (inset map) the more potentially significant distribution areas for each parent plant around the Mediterranean and Near East.

Palestinian Pollen and Plants on the Shroud

PLANT POLLENS CORRESPONDING TO THE SHROUD'S HISTORICALLY DEFINITE TRAVELS AROUND WESTERN EUROPE AND THE WESTERN MEDITERRANEAN

- | | |
|--|--|
| <p>1. Varieties best known under their everyday names</p> <p>Anemone (<i>Anemone coronaria</i> L.)
 Beech (<i>Fagus sylvatica</i>)
 Castor-oil plant (<i>Ricinus communis</i> L.)
 Cedar of Lebanon (<i>Cedrus libanotica</i> Lk.)
 Cypress (<i>Cupressus sempervirens</i> L.)
 Hazel (<i>Corylus avellana</i> L.)
 Juniper (<i>Juniperus oxycedrus</i> L.)
 Laurel (<i>Laurus nobilis</i> L.)
 Love-lies-bleeding (<i>Amaranthus lividus</i> L.)
 Oriental plane tree (<i>Platanus orientalis</i> L.)
 Pine (<i>Pinus halepensis</i> L.)
 Pistacia (<i>Pistacia halepensis</i> L. & <i>Pistacia lentiscus</i> L.)
 Rice (<i>Oryza sativa</i> L.)</p> | <p>Rock rose (<i>Cistus creticus</i> L.)
 Rush (<i>Scirpus triquetrus</i> L.)
 Rye (<i>Secale spec.</i>)
 Spina Christi (<i>Paliurus Spina-Christi</i> Mill.)
 Thistle (<i>Carduus personata</i> Jacq.)
 Yew (<i>Taxus baccata</i> L.)</p> |
| | <p>2. Other varieties</p> <p><i>Alnus glutinosa</i> Vill
 <i>Capparis spec.</i>
 <i>Carpinus betulus</i> L.
 <i>Lythrum salicaria</i> L.
 <i>Phyllirea angustifolia</i> L.
 <i>Poterium spinosum</i> L.
 <i>Ridolfia segetum moris</i></p> |

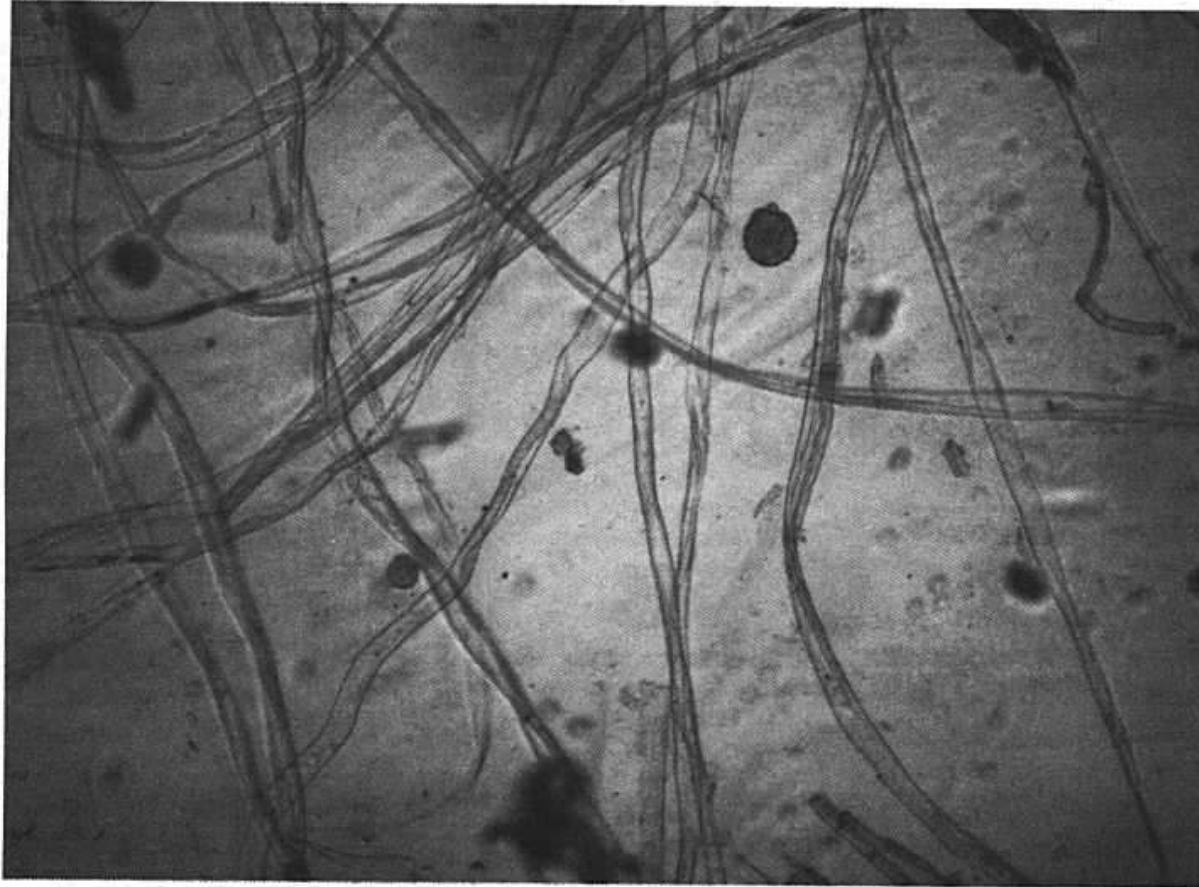
PLANT POLLENS INDICATIVE OF THE SHROUD AT SOME TIME IN ITS HISTORY HAVING BEEN IN NEAR EASTERN ENVIRONS, PARTICULARLY ANATOLIA AND ISRAEL

- | | |
|---|--|
| <p>1. Varieties found in desert and semi-desert terrain</p> <p><i>Acacia</i> (<i>Acacia albida</i> Del.)
 <i>Artemisia Herba-Alba</i> A.
 <i>Atraphaxis spinosa</i> L.
 <i>Haplophyllum tuberculatum</i> J.
 <i>Helianthemum versicarium</i> B.
 <i>Oligoneurus subulata</i> Boiss.
 <i>Peganum Harmala</i> L.
 <i>Pteranthus dichotomus</i> Forsk.
 <i>Scabiosa proflera</i> L.</p> | <p>4. Varieties found in salty environs, particularly the Dead Sea</p> <p><i>Althea officinalis</i> L.
 <i>Anabasis aphylla</i> L.
 <i>Gundelia Tournefortii</i> L.
 <i>Haloxylon persicum</i> Bg.
 <i>Prosopis farcta</i> Macbr.
 <i>Reaumuria hirtella</i> J. & Sp.
 <i>Suaeda aegyptiaca</i> Zoh.
 <i>Tamarix nitotica</i> Bunge</p> |
| <p>2. Varieties found in steppe type terrain, as in eastern Turkey and southern Israel</p> <p><i>Claucium grandiflorum</i>
 <i>Hyoscyamus reticulatus</i> L.
 <i>Ixiolimon montanum</i> Herb.
 <i>Linum mucronatum</i> Bert.
 <i>Roemeria hybrida</i> (L.) DC.
 <i>Silene conoida</i> L.</p> | <p>5. Varieties particularly typical of the environs of Jerusalem</p> <p><i>Bassia muricata</i> Asch
 <i>Echinops glaberimus</i> DC
 <i>Fagonia mollis</i> Del.
 <i>Hyoscyamus aureus</i> L.
 <i>Onosma syriacum</i> Labil.
 <i>Zygophyllum dumosum</i> B.</p> |
| <p>3. Varieties particularly typical of Anatolian (Turkish) environs</p> <p><i>Epimedium pubigerum</i> DC.
 <i>Prunus spartioides</i> Spach</p> | |

Note: All regionalisations are approximations.

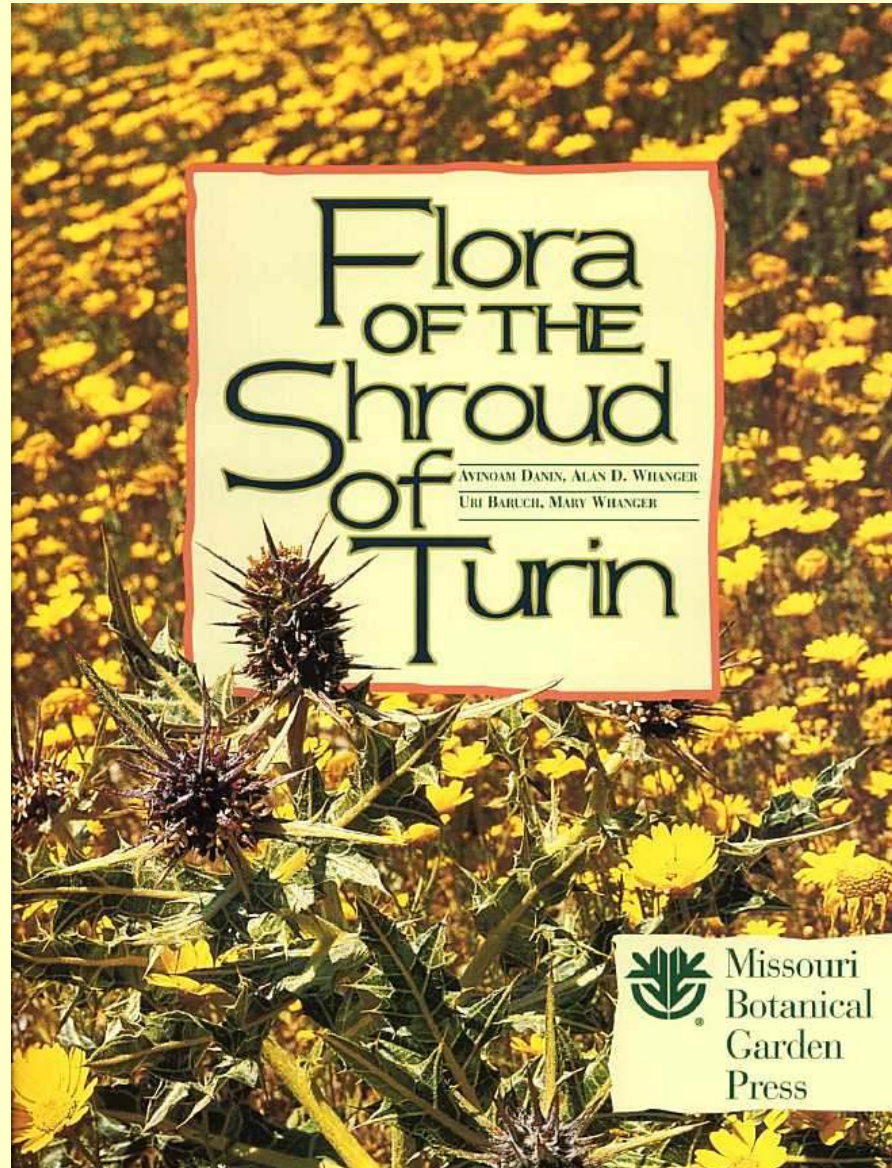
Fig 10 The pollen varieties found on the Shroud, as identified by Dr Max Frei. Chart of the plants represented by the pollens Dr Max Frei claimed to have found amongst the Shroud dust, with the regions from which these plant varieties mostly derive. Dr Frei did not live to complete his research, and this list has been adapted from one published posthumously on his behalf by Prof. Heinrich Pfeiffer

Palestinian Pollen and Plants on the Shroud



Photomicrograph of slide 6-B/d from the Max Frei collection. While this detail shows two or three of the many pollen grains found on that tape (which contains much more pollen than all of the other 25 tapes combined), they are from the lead end where Frei's gloves left the myriad of cotton fibers shown crisscrossing the area. Clean gloves should have left no pollens in this area. McCrone labels this—and a suspicious smear of several hundred pollens on the body of the same tape—"contamination." (Photomicrograph courtesy of Paul C. Maloney, ASSIST)

Palestinian Pollen and Plants on the Shroud



Palestinian Pollen and Plants on the Shroud

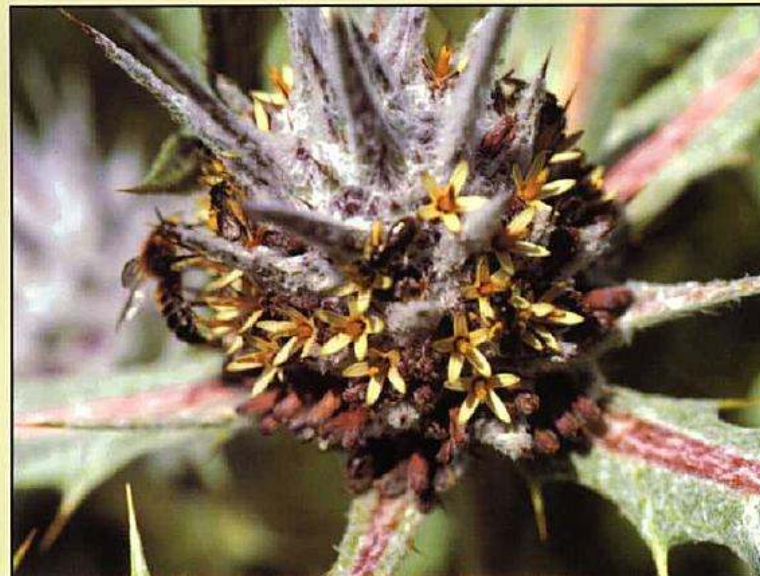


Palestinian Pollen and Plants on the Shroud

Table 1. Baruch (1998) annotations on Frei pollen slides collected by Frei in 1973.

Slide number	Frei (1973) determination	Baruch (1998) determination
01	<i>Anabasis aphylla</i>	Confirmed as <i>Anabasis</i> -type
02	<i>Alnus glutinosa</i>	Empty
04	<i>Acacia albida</i>	Confirmed as <i>Acacia</i> sp.
05	<i>Artemisia herba-alba</i>	Confirmed as <i>Artemisia</i> sp.
06	<i>Atraphaxis spinosa</i>	Confirmed as <i>Atraphaxis</i> sp.
07	<i>Capparis ovata</i>	<i>Capparis</i> sp. + non <i>Capparis</i>
08	<i>Carduus</i>	<i>Cedrus</i> sp. + <i>Carduus</i> -type
09	<i>Carpinus betulus</i>	At the present status-not identifiable
10	<i>Cedrus libanoticus</i>	Confirmed as <i>Cedrus</i> sp.
11	<i>Corylus avelana</i>	At the present status-not identifiable
13	<i>Echinops glaberrimus</i>	Confirmed as <i>Echinops</i> sp.
15	<i>Fagonia mollis</i>	<i>Fagonia</i> that looks like <i>F. arabica</i> in Danin's control
16	<i>Fagus sylvatica</i>	Inconclusive material
17	<i>Glaucium grandiflorum</i>	<i>Echinops</i> ; the <i>Glaucium</i> is not found
18	<i>Gundelia tournefortii</i>	Confirmed
20	<i>Haplophyllum tuberculatum</i>	Confirmed as <i>Haplophyllum</i> sp.
21	<i>Helianthemum vesicarium</i>	Cistaceae; the slide is not clear enough
23	<i>Hyoscyamus reticulatus</i>	Confirmed as <i>Hyoscyamus</i> sp.
26	<i>Linum mucronatum</i>	Confirmed as <i>Linum</i> sp.
31	<i>Paliurus spina-christi</i>	Either <i>Paliurus</i> sp. or <i>Ziziphus</i> sp.
32	<i>Peganum harmala</i>	Cannot be confirmed
34	<i>Sarcopoterium spinosum</i>	Cannot be confirmed
35	<i>Prosopis farcta</i>	Confirmed
38	<i>Reaumuria hirtella</i>	Confirmed as <i>Reaumuria</i> sp.
39	<i>Ricinus communis</i>	Confirmed
41	<i>Scabiosa prolifera</i>	Confirmed + <i>Centaurea solstitialis</i> -type, + <i>Tubiflorae</i>
42	<i>Scirpus</i>	Confirmed as Cyperaceae
43	<i>Secale</i>	Confirmed as Poaceae
45	<i>Suaeda</i>	Confirmed as Chenopodiaceae
46	<i>Tamarix</i>	Confirmed as <i>Tamarix</i> sp.
47	<i>Taxus</i>	Could not be confirmed

Palestinian Pollen and Plants on the Shroud



Palestinian Pollen and Plants on the Shroud

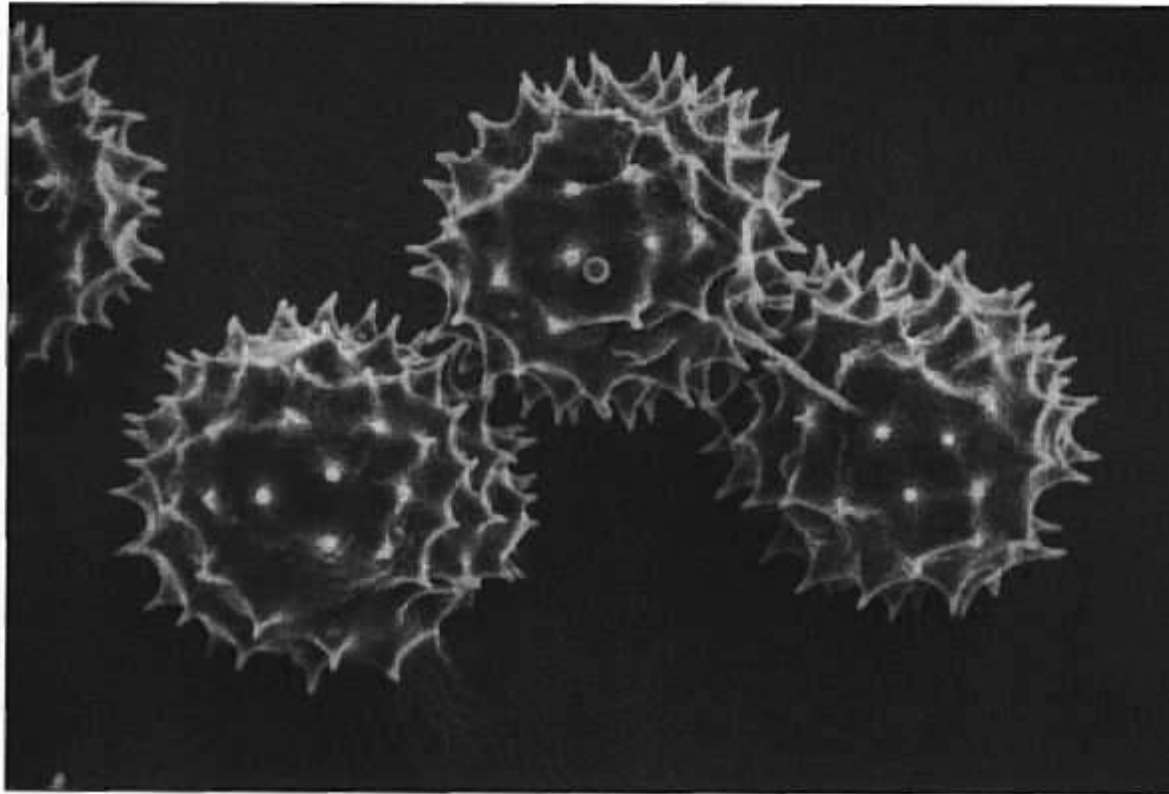


Figure 5. Scanning electron micrograph (SEM) of *Gundelia tournefortii* pollen grains from the control (collected by A. Danin at the Judean Desert, some 12 km E of Jerusalem to Jericho, March 27, 1996; specimen deposited at CSST).

Palestinian Pollen and Plants on the Shroud



Figure 4. *Gundelia tournefortii* pollen grain from the Shroud extracted from tape 6Bd; also visible are two fibers from the Shroud. Microphotograph taken by U. Baruch at 160 \times .

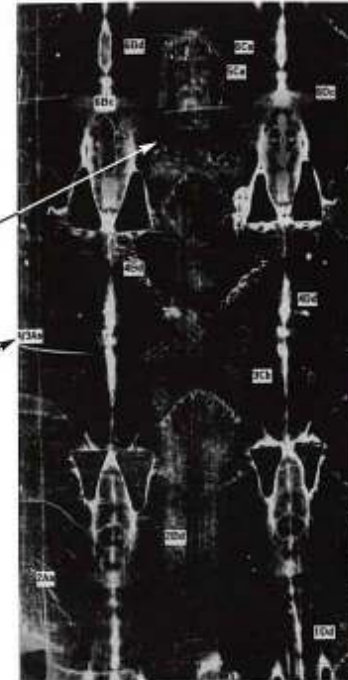
Palestinian Pollen and Plants on the Shroud



ABOVE: A specimen of *Gundelia tournefortii* photographed in spring by Prof. Avinoam Danin in the northern Negev region of Israel, a little to the south of Jerusalem. This single plant, of distinctively Middle Eastern provenance, accounts for one third of all the pollen specimens so far found and 'logged' on the Shroud by Prof. Danin and his colleague Uri Baruch. Note the plant's fearsome spikes, raising the as yet unresolved puzzle of why it should be so strongly represented on the Shroud.

Whanger and Danin see an image of *Gundelia tournefortii* plant here on the Shroud man's shoulder.

The highest incidence of *Gundelia tournefortii* pollens were found here at the Shroud's edge.

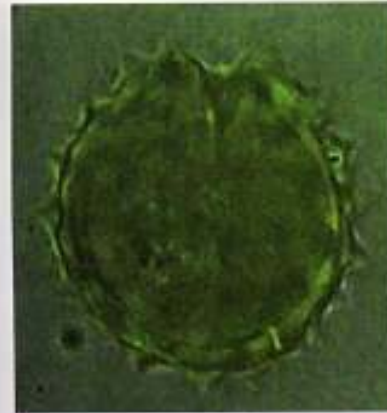


ABOVE RIGHT: 'Map' of the locations of the sticky tapes which Dr Max Frei applied to the Shroud in order to obtain his pollen specimens. Curiously, the tape with the greatest number of specimens of *Gundelia tournefortii*, tape 4/3.Aa, was taken from the Shroud's edge.

Palestinian Pollen and Plants on the Shroud



ABOVE: Dr Alan Whanger holding one of the albums containing Dr Max Frei's collection of sticky-tape specimens taken from the Shroud. Each tape was carefully numbered, and a record was kept of the location on the Shroud from which it was taken.

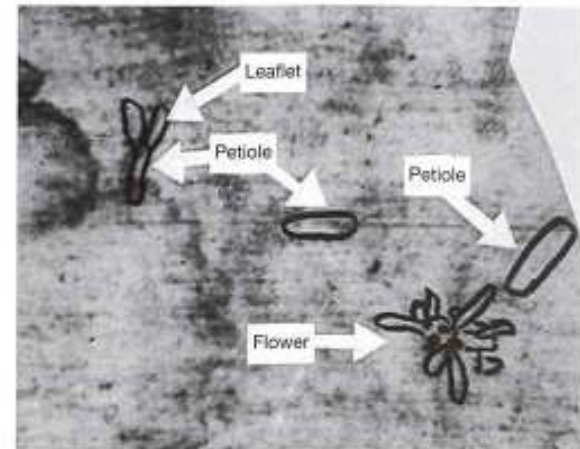
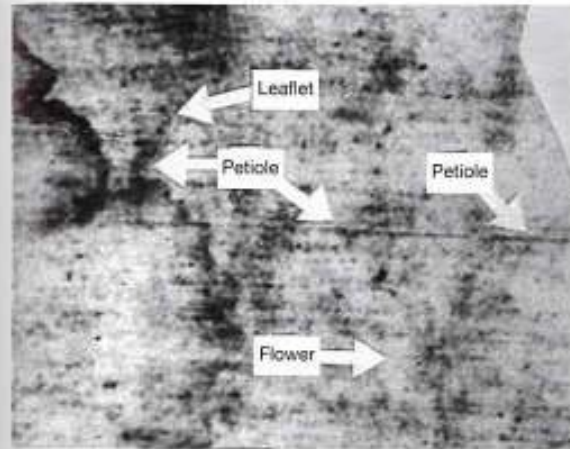


*ABOVE LEFT: Pollen specimen of *Gundelia tournefortii* (top) found by author Ian Wilson on the Shroud in the course of studying one of the Frei tapes, with (below) a control specimen for comparison purposes.*

Palestinian Pollen and Plants on the Shroud



ABOVE: *Zygophyllum dumosum*, or bean caper. Professor Danin sees an imprint of this plant on the Shroud.



TOP LEFT AND RIGHT: Location of the alleged *Zygophyllum dumosum* imprint on the Shroud showing natural appearance (left), and enhanced (right).

Then Alan pointed out to us some of the different flower images. In various instances, as in the case of the chrysanthemum, a flower-like shape was undeniably there. The problem was that, when other areas of the cloth image were viewed the same way, all sorts of shapes were discernible that might be construed to be flowers, some corresponding to the Mediterranean

Palestinian Pollen and Plants on the Shroud



Figure 10. *Zygophyllum dumosum* vegetative and floral images on the Shroud.

Palestinian Pollen and Plants on the Shroud

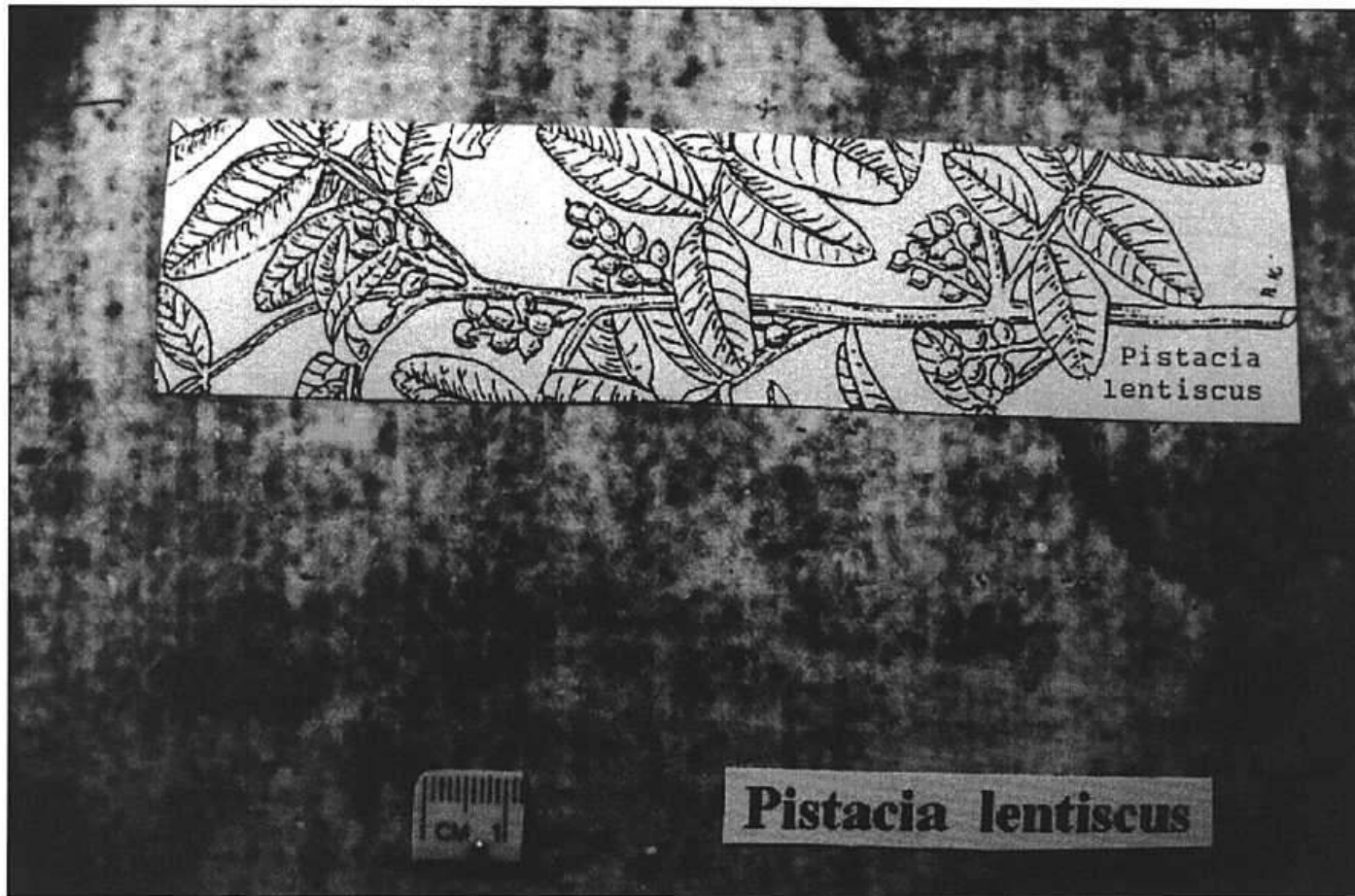


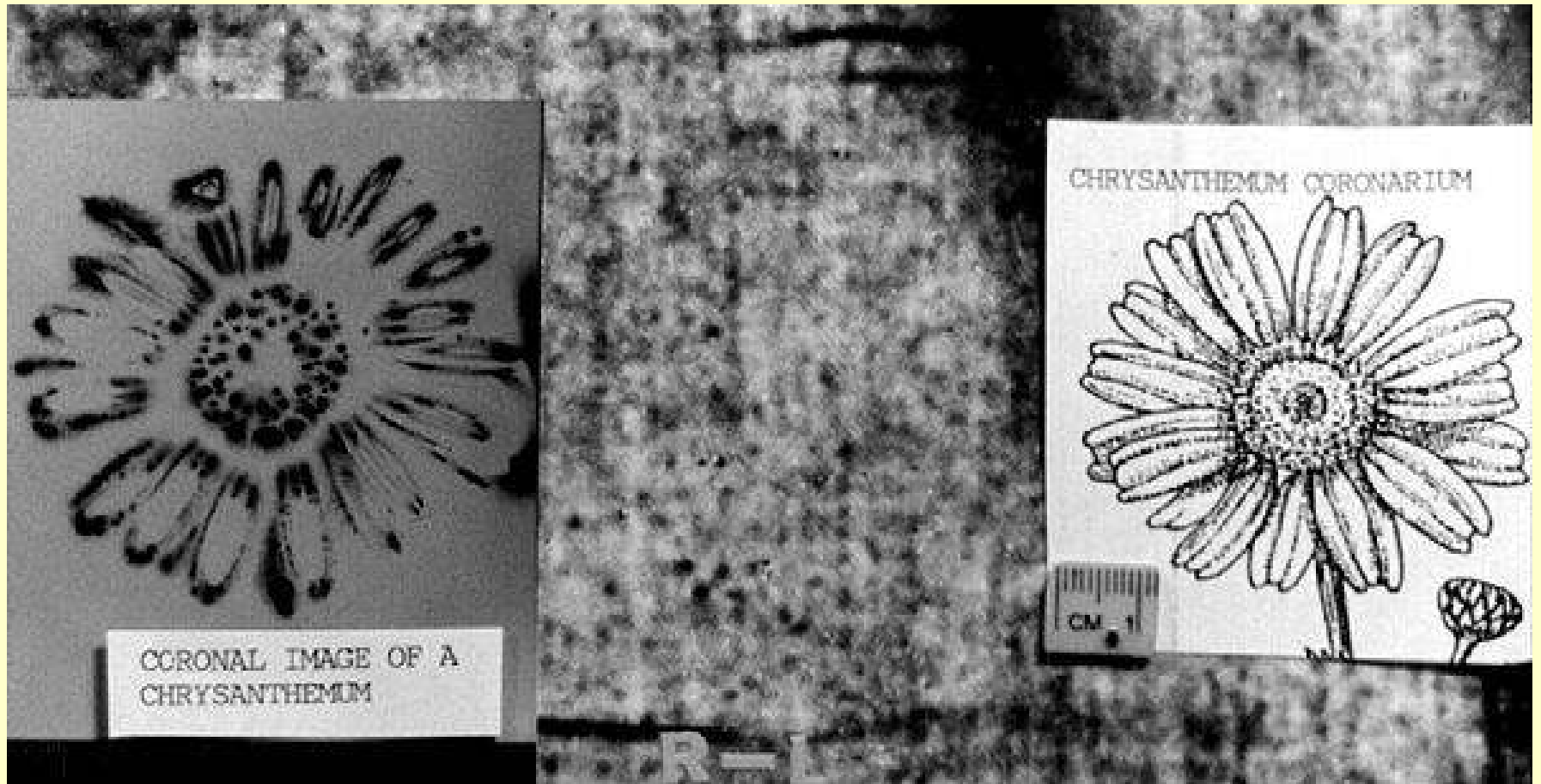
Figure 14. A fertile branch carrying three fruits of *Pistacia lentiscus* with a section from Koppel (1972).

Palestinian Pollen and Plants on the Shroud



Figure 8. *Chrysanthemum* cf. *coronarium*—image on the Shroud at the center. A capitulum of this species drawn by Koppel (1978) on the right. A corona electrostatic discharge by Scheuermann (1983) of *Chrysanthemum* sp. on the left.

Palestinian Pollen and Plants on the Shroud



Palestinian Pollen and Plants on the Shroud



Palestinian Pollen and Plants on the Shroud

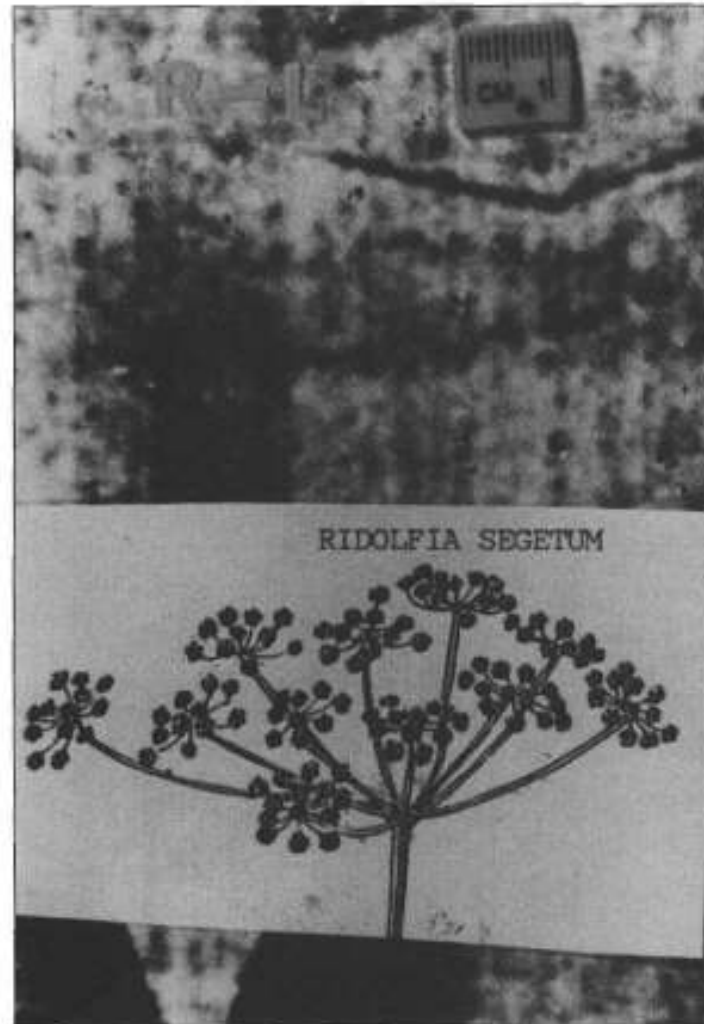


Figure 19. *Ridolfia segetum* inflorescence on the Shroud (No. 7 in Figure 7) compared with a section from Torn (1972).

Palestinian Pollen and Plants on the Shroud

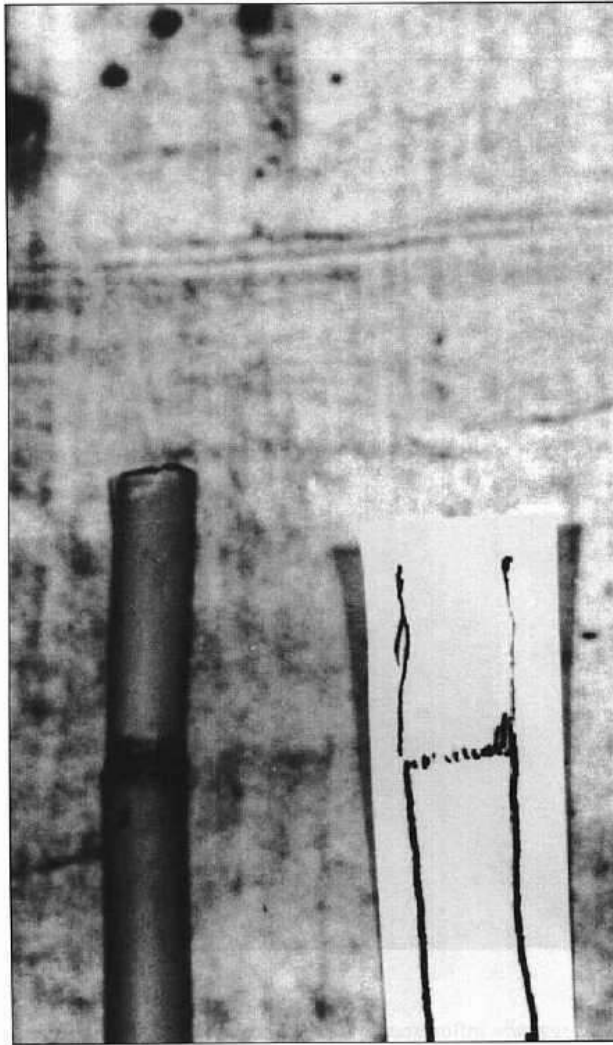


Figure 20. A stem of a reed species (possibly *Arundo donax*) displaying typical internode and node stem structure in the image.

Summary of Shroud Science and Pseudoscience

- The Shroud of Turin is an artistic representation of the Shroud of Jesus created early in the Fourteenth Century, certainly for the purpose of attracting pilgrims.
- The artist who created the Shroud, the “Master of Lirey,” used a variety of pigments, primarily red ochre and vermilion, to create the body and blood images.
- The unusual optical effects of the Shroud—its photographic negative and three-dimensional qualities—are not special, miraculous, or difficult to explain, but entirely natural.
- There is no real blood, Palestinian pollen and plant images, or the DNA of God on the Shroud.
- Individuals promoting the authenticity of the Shroud using scientific evidence are participating in a pseudoscience.