

The Shroud of Turin - Evidence it is authentic

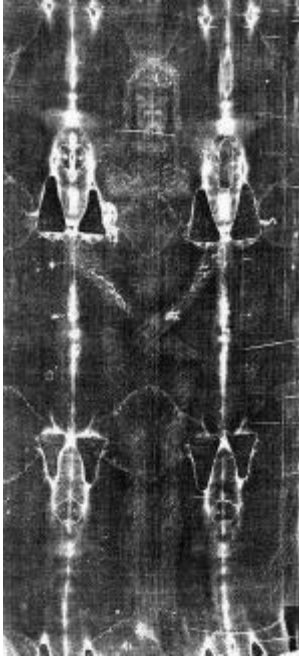
Below is a summary of scientific and historical evidence supportive of the authenticity of the Shroud of Turin as the ancient burial cloth of the historical Jesus of Nazareth.

by John C. Iannone

THE SHROUD AS AN ANCIENT TEXTILE



The Shroud is a linen cloth woven in a 3-over-1 herringbone pattern, and measures 14'3" x 3'7". These dimensions correlate with ancient measurements of 2 cubits x 8 cubits - consistent with loom technology of the period. The finer weave of 3-over-1 herringbone is consistent with the New Testament statement that the "sindon" (or shroud) was purchased by Joseph of Arimathea, who was a wealthy man. Also, Leviticus 19:19 speaks of the mixing of linen and cotton, but prohibits linen and wool or the mixing of vegetable and animal. In 1969, Dr. Gilbert Raes of the Ghent Institute of Textile Technology in Belgium noted that there are traces of cotton (identified as *Gossypium herbaceum*) in the linen of the Shroud.



In June 2002, the Shroud was sent to a team of experts for restoration. One of them was Swiss textile historian Mechthild Flury-Lemberg. She was surprised to find a peculiar stitching pattern in the seam of one long side of the Shroud, where a three-inch wide strip of the same original fabric was sewn onto a larger segment. The stitching pattern, which she says was the work of a professional, is quite similar to the hem of a cloth found in the tombs of the Jewish fortress of Masada.

The Masada cloth dates to between 40 BC and 73 AD. This kind of stitch has never been found in Medieval Europe.

1988 CARBON-14 TEST REFUTED

Several studies have challenged the validity of the 1988 Carbon-14 tests done at Oxford, Zurich and Arizona Labs.

1. A Jan 20, 2005 paper in the professional journal *ThermoChimica Acta* by Dr. Ray Rogers, retired Fellow with the Los Alamos Scientific Laboratory and lead chemist with the original science team STURP (the 1978 Shroud of Turin Research Project, involving approximately 35 scientists directly examining the Shroud for five days), has proven conclusively that the sample cut from The Shroud of Turin in 1988 was taken from an area of the cloth that was re-woven during the middle ages. Here are some excerpts:

"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. The radiocarbon date was thus not valid for determining the true age of the shroud."

"The shroud was badly damaged in a church fire in 1532 AD. Nuns patched burn holes and stitched the shroud to a reinforcing cloth that is now known as the Holland cloth." This probably occurred in 1534.

"As part of the shroud of turin research project (STURP), I took 32 adhesive-tape samples from all areas of the shroud and associated textiles in 1978." "It enabled direct chemical testing on recovered linen fibers and particulates".

"If the shroud had been produced between 1260 and 1390 AD, as indicated by the radiocarbon analyses, lignin should be easy to detect. A linen produced in 1260 AD would have retained about 37% of its vanillin in 1978... The Holland cloth, and all other medieval linens gave the test [i.e. tested positive] for vanillin wherever lignin could be observed on growth nodes. The disappearance of all traces of vanillin from the lignin in the shroud indicates a much older age than the radiocarbon laboratories reported."

"The fire of 1532 could not have greatly affected the vanillin content of lignin in all parts of the shroud equally. The thermal conductivity of linen is very low... therefore, the unscorched parts of the folded cloth could not have become very hot." "The cloth's center would not have heated at all in the time available. The rapid change in color from black to white at the margins of the scorches illustrates this fact." "Different amounts of vanillin would have been lost in different areas. No samples from any location on the shroud gave the vanillin test [i.e. tested positive]." "The lignin on shroud samples and on samples from the Dead Sea scrolls does not give the test [i.e. tests negative]."

"Because the shroud and other very old linens do not give the vanillin test [i.e. test negative], the cloth must be quite old." "A determination of the kinetics of vanillin loss suggests that the shroud is between 1300- and 3000-years old. Even allowing for errors in the measurements and assumptions about storage conditions, the cloth is unlikely to be as young as 840 years."

"A gum/dye/mordant [(for affixing dye)] coating is easy to observe on... radiocarbon [sample] yarns. No other part of the shroud shows such a coating." "The radiocarbon sample had been dyed. Dyeing was probably done intentionally on pristine replacement material to match the color of the older, sepia-colored cloth." "The dye found on the radiocarbon sample was not used in Europe before about 1291 AD and was not common until more than 100 years later." "Specifically, the color and distribution of the coating implies that repairs were made at an unknown time with foreign linen dyed to match the older original material." "The consequence of this conclusion is that the radiocarbon sample was not representative of the original cloth."

"The combined evidence from chemical kinetics, analytical chemistry, cotton content, and pyrolysis-mass-spectrometry proves that the material from the radiocarbon area of the shroud is significantly different from that of the main cloth. The radiocarbon sample was thus not part of the original cloth and is invalid for determining the age of the shroud."

"A significant amount of charred cellulose was removed during a restoration of the shroud in 2002." "A new radiocarbon analysis should be done on the charred material retained from the 2002 restoration."

Raymond N. Rogers. 20 January 2005. Studies on the radiocarbon sample from the shroud of turin. *Thermochimica Acta*, Vol. 425, Issue 1-2, Pages 189-194.

2. The Fire-Model Tests of Dr. Dmitri Kouznetsov in 1994 and Drs. John Jackson and Propp in 1998, which replicated the famous Fire of 1532, demonstrate that the fire added carbon isotopes to the linen.

3. Dr. Leoncio Garza-Valdes (microbiologist) discovered a bioplastic coating of bacteria and fungus on the linen fibers (60% by weight) caused by living microbes that absorb and add C-14 to the Cloth and thereby skew the date by at least 1300 years. These microbes were not known at the time of the test and were not removed by the C-14 cleaning protocol.

4. Consistent problems with the dating of linens (Egyptian Bull Mummy; Mummy 1770 Manchester Museum; Ibis Bird Mummy) call the accuracy of linen testing into question.

BURIAL CONSISTENT WITH ANCIENT JEWISH BURIAL CUSTOM

The burial is consistent with ancient Jewish burial customs in all respects, including the use of cave-tombs, attitude of the body (hands folded over loins), and types of burial cloths. The Sindon (Shroud) enveloped the body. The Sudarium was a face-cloth used to cover the face out of respect during removal from the cross through entombment. It was then removed and placed to one side. There was also a chin-band holding the mouth closed. The Othonia were bandages used to bind the wrists and legs. All are mentioned in the New Testament and evidenced on the Cloth. Such cloths are spoken of in the Mishnah - oral traditions of the Rabbis written down in the second and third century. The Cave-Tombs were carved out of sides of limestone hills. The presence of Calcium Carbonate (limestone dust) on the Cloth was noted by Dr. Eugenia Nitowski (Utah archaeologist) in her studies of the cave tombs of Jerusalem. Optical Engineer Sam Pellicori noted in 1978 the presence of dirt particles on the nose as well as on the left knee and heel. Prof. Giovanni Riggi noted burial mites. Dr. Garza-Valdes discovered oak tubules (microscopic splinters) in the blood of the occipital area (back of the head) as well as natron salts. Traces of aloe and myrrh have also been identified on the Cloth. These are consistent with Jewish burial customs of antiquity.

IMAGE FORMATION vs. WORK OF AN ARTIST

No one knows for sure how the images were created. **The images are scorch-like, yet not created by heat, and are a purely surface phenomenon limited to the crowns of the top fibers.** The Shroud is clearly not a painting. There are no signs of penetration. **The blood was on the Cloth before the image** (an unlikely way for an artist to work). There is no outline, no binders to hold paint, no evidence that paint, dye, ink, or chalk

created the images, and there are no brush strokes. According to world-renowned artist Isabel Piczek, the images have no style that would fit into any period of art history. The images show perfect photo-negativity and 3-dimensionality. It is not a Vaporgraph or natural result of vapors.

Note: some microscopic particles of paint exist on the Shroud, but these do not constitute the image. During the Middle Ages, a practice called the "sanctification of paintings" permitted about 50 artists to paint replicas of the Shroud and then lay their paintings over the Shroud to "sanctify" them. This permitted contact transfer of particles, which then migrated around the cloth with the folding and rolling of the Shroud when it was opened for exhibit and closed again afterwards.

STURP determined that the image was caused by rapid dehydration, oxidation and degradation of the linen by an unidentified process, coloring it a sepia or straw yellow. Several Physicists, including Dr. John Jackson of the Colorado Shroud Center, suggest that a form of columnated radiation is the best explanation for how the image was formed, leaving a scorch-like appearance (the scorch caused by light versus heat, as the image does not fluoresce). Dr. Thomas Phillips (nuclear physicist at Duke University and formerly with the High Energy Labs at Harvard) says a potential miliburst of radiation (a neutron flux) could be consistent with the moment of resurrection. Such a miliburst might cause the purely surface phenomenon of the scorch-like (scorch-by-light) images, and possibly add Carbon-14 to the Cloth. As Dr. Phillips points out: "We never had a resurrection to study" and more testing should be done to ascertain whether a neutron-flux occurred.

The coloration on the linen fibers on the Shroud is extremely thin. Sticky tape samples taken from different parts of the image on the Shroud's surface in 1978 were too thin to measure accurately with a standard optical microscope, which means they were thinner than the wavelength of visible light, or less than about 0.6 micrometers. A more recent measurement of the coloration on one of the fibers was found to be about 0.2 micrometers thick (or one-fifth of a thousandth of a millimeter).

Italian scientists working at the National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA) conducted experiments on their own time between 2005 and 2010, applying ultraviolet radiation to strips of linen to see if they could match the coloration on the fibers of the Shroud of Turin. In their ENEA technical report, published in November 2011, they wrote that particular doses of radiation left a thin coating on linen fibers that resemble the colored fibers on the image of the Shroud of Turin. When questioned, the lead scientist in the study, Paolo Di Lazzaro, said that vacuum ultraviolet radiation (VUV, wavelength 200-100 nanometers) from laser pulses lasting less than 50 nanoseconds produced the best effect.

These findings support the idea that the image on the Shroud was made by a sudden blast of high-energy radiation. They also refute the possibility of forgery, since lasers were obviously not available in medieval times.

The technical report: P. Di Lazzaro, D. Murra, E. Nichelatti, A. Santoni, G. Baldacchini: "Colorazione similindonica di tessuti di lino tramite radiazione nel lontano ultravioletto: riassunto dei risultati ottenuti presso il Centro ENEA di Frascati negli anni 2005-2010" RT/2011/14/ENEA (2011).

BLOOD EVIDENCE (vs. PAINT THEORY)

The blood on the Shroud is real, human male blood of the type AB (typed by Dr. Baima Ballone in Turin and confirmed in the U.S.). This blood type is rare (3.2% of the world population, according to Dr. Leoncio Garza-Valdes of the University of Texas Health Science Center), and is found mostly in the Middle East, with the highest percentage being in northern Palestine. Blood chemist Dr. Alan Adler (Univ. of Western Connecticut) and the late Dr. John Heller (New England Institute of Medicine) found a high concentration of the pigment bilirubin, consistent with someone dying under great stress or trauma and making the color more red than normal ancient blood. Drs. Victor and Nancy Tryon of the University of Texas Health Science Center found X & Y chromosomes representing male blood and "degraded DNA" (approximately 700 base pairs) "consistent with the supposition of ancient blood."

PATHOLOGY OF THE WOUNDS OF CRUCIFIXION AND THE SIGNATURE OF THE HISTORICAL JESUS

Numerous surgeons and pathologists (including Dr. Frederick Zugibe (Medical Examiner - Rockland, New York), Dr. Robert Bucklin (Medical Examiner - Las Vegas, Nevada), Dr. Herman Moedder (Germany), the late Dr. Pierre Barbet (France), and Dr. David Willis (England)) have studied the match between the Words, Weapons and Wounds, and agree that the words of the New Testament regarding the Passion clearly match the wounds depicted on the Shroud, and that these wounds are consistent with the weapons used by ancient Roman soldiers in Crucifixion.

Specifically, the scourge marks on the shoulders, back, and legs of the Man of the Shroud match the flagrum (Roman whip) which has three leather thongs, each having two lead or bone pellets (plumbatae) on the end. The lance wound in the right side matches the Roman Hasta (4cm x 1 cm spear wound). Iron nails (7" spikes) were used in the wrist area (versus the palms as commonly depicted in Medieval art). These marks, combined with the capping of thorns which is not found anywhere else in Crucifixion literature of ancient Roman (Tacitus, Suetonius, Pliny the Elder or Pliny the Younger) or Jewish historians (Flavius Joesphus, Philo of Alexandria) create a unique signature of the historical Jesus of Nazareth.

THE SUDARIUM CHRISTI - THE FACE CLOTH OF CHRIST

In the Cathedral of Oviedo in northern Spain is a linen cloth called the Sudarium Christi, or the Face Cloth of Christ. It is often referred to as the Cloth of Oviedo. Modern studies by the Spanish Centre for Sindonology (Dr. Jose Villalain, Jaime Izquierdo and Guillermo Heras of the University of Valencia, as noted by Oviedo scholar Mark Guscini) using infrared and ultraviolet photography and electron microscopy have demonstrated that this Cloth, along with the Shroud of Turin, both touched the same face. Tradition and historical information (now supported by contemporary scientific research) support the belief of millions of people that the face touched by both cloths was that of the historical Jesus of Nazareth. The two cloths are believed to have touched the same face at different points in the burial process. The Oviedo Cloth was placed around the head from the time death occurred on the Cross till the body was covered by the Shroud in the Garden Tomb. Then it was removed and placed to one side (John 20:7). Mark Guscini notes that the practice of covering the face is referenced in the Talmud (Moed Katan 27a). He adds that Rabbi Alfred Kolatch in NY talks of the Kevod Ha-Met or "respect for the dead" as the reason for covering the head. Rabbi Michael Tuktzinsky of Jerusalem in his *Sefer Geshet Cha'yim* (Volume 1, Chapter 3, 1911) offers as a reason that it is a hardship for onlookers to gaze on the face of a dead person.

The Sudarium Christi is a poor quality linen cloth, like a handkerchief, measuring 84 x 53 centimeters. Unlike the Shroud of Turin, it does not have an image. However, it does have bloodstains and serum stains from pulmonary edema fluid which match the blood and serum patterns and blood type (AB) of the Shroud of Turin. The length of the nose on both cloths is 8 centimeters (3 inches). Pollen grains found on the Cloth of Oviedo by Dr. Max Frei in 1973 and 1978 and studied also by Monsignor Giulio Ricci match pollen grains found on the Shroud of Turin. Dr. Uri Baruch (expert palynologist from the Israel Antiquities Authority) has indicated that one of these pollen matches is *Gundelia tournefortii* - a thorn/thistle bush that is indigenous to the Holy Land. Dr. Avinoam Danin (botanist and expert on the flora of the Holy Land who teaches at Hebrew University in Jerusalem) reports that *Gundelia tournefortii* serves as a "geographic and calendar indicator" that the origin or provenance of the cloths is the Holy Land.

The Sudarium Christi has a well-documented history. One source traces the cloth back as far as 570 AD. Pelayo, Bishop of Oviedo in the 1100's, noted in his *Chronicles* that the Oviedo Cloth left Jerusalem in 614 AD in the face of the Persian attack led by King Chosroes II, and made its way across North Africa to Spain. It was transported to Oviedo in a silver ark (large box) along with many other sacred relics. The fact that both cloths touched the same face, and that the Oviedo Cloth can be traced historically to a date as early as 570 AD are further proof that the Carbon-14 dating of the Shroud to between

1260 -1390 AD cannot be correct. Those wishing to read the work of Oviedo scholar Mark Guscini may read *The Oviedo Cloth* - The Luttenworth Press 1998, Cambridge, CT. ISBN 07188-2985-9.

PRESENCE OF POLLEN GRAINS AND FLORAL IMAGES



In 1995, Israeli botanist and expert on the plant life of Israel Dr. Avinoam Danin, a Professor at Hebrew University in Jerusalem, confirmed findings by Dr. Alan Whanger, Professor Emeritus at Duke University in North Carolina, of floral images on enhanced Shroud photographs. They were joined by Dr. Uri Baruch of the Israel Antiquities Authority, a palynologist and expert on Israel's pollen. Danin studied the plant images and Baruch analyzed the pollen grains found by the late Swiss criminologist and botanist Dr. Max Frei via the sticky tape collection of materials that Frei had taken from the Shroud in 1973 and 1978.

The team has identified, the "inflorescence of the crown chrysanthemum (*Chrysanthemum coronarium*)"; the Rock Rose (*Cistus creticus*) lateral to the left cheek of the figure on the Shroud; a bouquet of bean caper plants (*Zygophyllum dumosum*); and a thorn tumbleweed (*Gundelia tournefortii*) which Whanger speculates comprised the Crown of Thorns.

Danin indicates that the pollen grains serve as "geographic and calendar indicators" demonstrating that the origin or provenance of the Shroud was definitely the Holy Land, and more specifically an area in and around Jerusalem. *Zygophyllum dumosum*, for example, grows only in Israel, Jordan and the Sinai. Evidence also suggests that the flowers on the Shroud were picked in the Spring. Danin notes that "...they could have been picked fresh in the fields. A few of the species could be found in the markets of Jerusalem in the Spring of the year" - a period consistent with the time of the Passover and the Crucifixion.

It appears that bunches or bouquets of flowers were once placed on the Shroud, leaving pollen grains and imprints of plants and flowers on the linen cloth. It provides important evidence regarding the origin of this cloth in the Holy Land, and indicates that the Man of the Shroud was entombed with flowers from the waist up to the head.

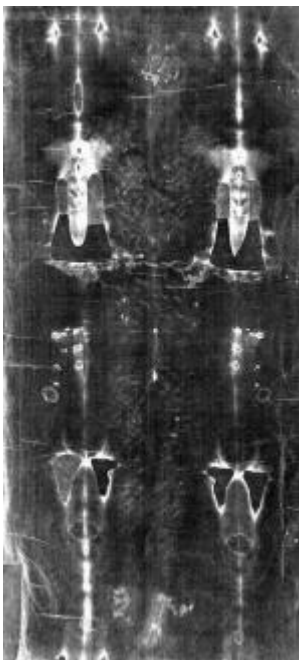
HISTORICAL REFERENCES

There are many historical references. Among them are the ancient Abgar Legends which place the cloth in the City of Edessa (Turkey), 400 miles north of Jerusalem during reign of King Abgar V, somewhere between 30 - 40 AD. Pollen finds confirm the presence in Edessa (Anatolian Steppe). Ancient historians Eusebius and Evagrius speak of the Cloth moving with disciple Thaddaeus to Edessa. The Acts of Holy Apostle Thaddaeus (6th Century) speaks of the tetradiplon (cloth doubled-in-four). Dr. John Jackson's raking light test of 1978 confirms fold marks matching tetradiplon. The Byzantine Greeks speak of the Acheiropoietas: image not made with human hands. There is a reference by a Chronicler of the 4th Crusade (Robert de Clari) that the "sindoine" disappeared from Constantinople in 1204.

SHROUD ILLUSTRATED IN PRAY MANUSCRIPT

In the Budapest National Library is the Pray Manuscript, the oldest surviving text of the Hungarian language. It was written between 1192 and 1195 AD (65 years before the earliest Carbon-14 date in the 1988 tests). One of its illustrations shows preparations for the burial of Christ. The picture includes a burial cloth with the same herringbone weave as the Shroud, plus 4 holes near one of the edges. The holes form an "L" shape. This odd pattern of holes is found on the Shroud of Turin. They are burn holes, perhaps from a hot poker or incense embers.

ANCIENT COINS OF PONTIUS PILATE?



3-D imagery of NASA's VP-8 Image Analyzer (Dr. John Jackson, Dr. Eric Jumper and Rev. Kenneth Stevenson in 1978) shows "dense, button-like objects over the eyes" about the size of a U.S. dime. Macrophotography (by the late Fr. Francis Filas, S.J. of Loyola U. in Chicago), and digitalization of the eye area (Dr. Robert Haralick, U. of Virginia Spatial Data Analysis Lab) suggest coin-lettering consistent with the Lepton (Widow's Mite) minted by Pontius Pilate between 29 - 32 AD. Specifically, Filas makes a case for the letters "UCAI", which are on the lepton, and Haralick's digitalization appears to confirm these four raised letters. They are consistent with the "U" of Tiberius and "CAI" of Caesar (Tiberiou Caesaros) printed on the coins. Normally, coins would be minted with Greek lettering and we would have anticipated "UKAI". However, many leptons were misspelled with Latin "UCAI".

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Text supplemented in 2004 and 2005, clarified in 2009, and supplemented in 2011 by J.M. Fischer.
Shroud photos courtesy of Barrie M. Schwartz. 1978

**For an in-depth scientific analysis of the Shroud, see Dr. Rogers' FAQ at
<http://www.shroudstory.com/faq/index.htm>**