

THE ASSIST NEWSLETTER

The Association of Scientists and Scholars International for the Shroud of Turin, Ltd. December, 1989

ASSIST and the Paris Symposium on the Shroud of Turin

Shroud scholars, scientists, and interested others comprised a large symposium consisting of reports on original research and recent developments in sindonology held at the Centre Chaillot-Galliera, Paris, France on September 7-8.

ASSIST was represented by four researchers: Dr. Frederick T. Zugibe, President of ASSIST; Mr. Paul C. Maloney, Vice-President of ASSIST; Dr. Jeanette Cardamone, (textile chemist) ASSIST Investigations Group; and Dr. Alan D. Whanger (polaroid overlay specialist), ASSIST Investigations Group, who presented a photo-display of floral patterns he believes are inherent in the Shroud cloth. Each presented results of scientific study related to the understanding of the Shroud of Turin.

The abstracts of the research papers presented by these researchers are provided here for the readers of "The ASSIST Newsletter." The ASSIST Newsletter will publish Mr. Maloney's paper presented at the Paris Symposium in its entirety in Issue No. 3 of "The ASSIST Newsletter."

"Pierre Barbet Revisited"

Frederick T. Zugibe, M.D., Ph.D.

"One of the most widely quoted individuals in Shroud research is Dr. Pierre Barbet, the French surgeon of A Doctor At Calvary fame. This is not surprising since he introduced scientific experimentation into the study of crucifixion to better understand the Shroud and thus we have great respect for his work.

But following his studies there has been a paucity of scientific studies regarding the medical aspects of Shroud research and the failure of valid experimental studies that might challenge the validity of his studies.

Barbet's studies centered around three major hypotheses:

1. The Man of the Shroud was nailed through an area of the wrist called Destot's Space and not through the palm of the hand. We will examine this and other possibilities.
2. The missing thumb was due to injury to the median nerve by passage of the nail. We shall examine evidence for the missing thumb behind the first finger.
3. The Man of the Shroud died of asphyxiation. We will present the case for death by hypovolemic and traumatic shock."

"The Current Status of Pollen Research and Prospects for the Future"

Paul C. Maloney

"The Association of Scientists and Scholars International for the Shroud of Turin, Ltd. (ASSIST) has acquired the entire Max Frei Collection for Shroud Research. This paper constitutes the first public disclosure about the details of the nature of this collection and how it may be used for future research on the Shroud. The collection itself is a statement about the manner in which Dr. Frei approached his subject of enquiry and the caution he exercised during his study.

We will deal with the state of pollen research following the passing of Dr. Frei. A number of specialists in palynology and botany have examined his work and their preliminary assessment will be incorporated here. Dr. Frei's methodology and heretofore unpublished information about the material he had collected from the Shroud, from the field, and during laboratory work will be included. We will demonstrate from the data on the tapes Dr. Frei took in 1978 why he was able to obtain so many pollen and how the nature of his data differs substantially from that obtained by other methods of sample removal. We will also emphasize the importance of using the data from all methods of sample removal to fill out the picture of the nature of particulate distribution on the Shroud.

New, unpublished evidence from the Shroud capable of a number of interpretations may suggest the possibility that the Shroud might have been in an Eastern (Byzantine?) setting and offers support to Ian Wilson's "folded-in-four" hypothesis. Although not constituting proof, it is made public here for the first time to allow other scholars access to it.

Since ASSIST has access to an important resource for research on the Shroud, what are the prospects for the future? Using a new analytical technique on these tapes has revealed many more pollen grains than even Dr. Frei knew were available. Their study will offer new information about statistics, the identification of new pollen types, a method for the evaluation of the older published material, redefine the

work as a botanical enterprise rather than only a palynological one, plus raise suggestions for the future direction of work on the Shroud itself. We will also provide details about the material available on the tapes which will have implications for research in fields other than sindonic botany."

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"Promoting the Scientific Study of the Turin Shroud"

Statement of policy for "The ASSIST Newsletter"

"The ASSIST Newsletter," a publication of the Association of Scientists and Scholars International for the Shroud of Turin, Ltd., seeks to disseminate news, scholarly articles, and reviews representing varied viewpoints regarding recent scientific study of the Shroud of Turin.

ASSIST, as an organization, currently takes the position that no conclusions can be drawn regarding the authenticity or non-authenticity of the Shroud and its related issues without further scientifically controlled data obtained directly from the Shroud.

ASSIST protects the rights of individual members to hold divergent views.

No individual view published in "The ASSIST Newsletter" should be taken as representing the officially sanctioned view of the ASSIST Organization.

ASSIST actively encourages the airing of multiple, divergent views about the Shroud.

ASSIST actively seeks peer review of all published and pre-publication materials.

Letters Policy for "The ASSIST Newsletter"

"The ASSIST Newsletter" invites letters from the membership and readership as a regular feature of its communication function. News items, suggestions, questions, and responses to published material are welcome. Letters to the editor should be typed and must fulfil the publication policy guidelines of the ASSIST Organization. The editor reserves the right to return letters containing materials of an "emotional/explosive" nature for revision and to edit letters chosen for publication.

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Membership Information for Readers of "The ASSIST Newsletter"

"The ASSIST Newsletter" will be published at least twice per year, to be increased as resources allow. Membership in the Friends of Shroud Research division of ASSIST is automatic upon receipt of your annual contribution of \$15 (North America)/ \$18 (Overseas). Send checks, payable to "The ASSIST Newsletter," to Mr. Paul Maloney, P.O. Box 334, Quakertown, PA 18951. Membership application forms for the ASSIST Investigations Group and the ASSIST Associates divisions of ASSIST are available from Mr. Maloney. Also, please remember that the ASSIST Organization depends on the tax-deductible contributions of its members and friends to meet basic operating costs. Contributions are used to promote the continuing study of the Turin Shroud and are greatly appreciated.

ASSIST and The Paris Conference...(cont'd from p.1)

"Flax Cellulose: Characterization and Aging"

Dr. Jeanette M. Cardamone

"Flax cellulose fibers are characterized by specific chemical, physical, and mechanical properties. The characterization of flax will be described with reference to the related properties of cotton and wood cellulose.

Property changes can affect cellulose fiber morphology which is often examined as an indicator of change and which in old fibers can be used to monitor condition and degradation or aging.

The implication of property and morphology changes for the safe care, handling, and storage of linen fabric will be described with reference to the aging process. The degradation agents which cause aging will be outlined along with prescriptions from textile conservation research for arresting, retarding, and reversing cellulose aging.

Finally, methods for nondestructive characterization and analysis of aging will be discussed with reference to a recent study of an ancient Israeli linen fragment from Sepphoris.

In considering the Shroud of Turin, we need to determine

the exact condition of it before recommending specific methods for intervening in the causes of further degradation."

"Floral, Coin, and Other Non-Body Images on the Shroud of Turin: A Summary"

Dr. Alan and Mrs. Mary Whanger

"On the Shroud of Turin are images of large numbers of flowers and plants which closely resemble images that are made by a coronal type of energy discharge. These images are faint and generally of low contrast, and are of partially wilted flowers and plants bunched together, which makes them difficult to perceive without some photographic or computer enhancement, or without a comparative template of some sort. A number of these images, which may include not only the flowers, but in some cases also buds, leaves, stems, and fruit, can be recognized by comparing them with botanical drawings.

We feel we have made tentative identification of 28 of these plants, which we have photographed in detail. Of these

plants, all 28 grow in Israel: either in Jerusalem itself or in the nearby desert or Dead Sea areas. Using material taken from the Shroud on sticky tapes pressed to its surface which picked up hundreds of pollens and other particles, Dr. Max Frei was able to identify at least 58 different pollens on the Shroud. He had already identified pollens from 25 of the 28 plants whose images we have identified, with some variability in a few of the species.

Research on both the general appearance and coronal images of wilting flowers would indicate that the images on the Shroud were formed probably between 24 and 48 hours after the flowers were picked. The flowering time of 27 of the 28 identified flowers includes March and April.

These flower images on the Shroud were obviously much more visible in the earlier centuries of the Shroud's existence, since they have been highly accurately copied in a number of the early iconographic and other artistic depictions of Christ in many media including Byzantine coins between the 3rd and 10th centuries.

These observable data on the flower images and the pollens from the Shroud in addition to vast information from other sources indicate that the conclusion of the carbon dating studies of 1988 that the Shroud of Turin is of medieval (i.e., 13th or 14th century) origin is anomalous and erroneous, and that the Shroud origin is Israel in the first century. The Shroud is continuing to reveal new information and mysteries."

A Request for New Tests on the Turin Shroud

The following is the text of the document presented last year to His Eminence Archbishop Giovanni Saldarini, the new Archbishop of Turin, by Fr. Peter Rinaldi on behalf of ASSIST:

"On October 13, 1988 it was announced that the carbon date for the Shroud was set between A.D. 1260-1390. In the February 16, 1989 issue of the British journal, *Nature*, the formal results were released. A preliminary evaluation of those results indicate that the accelerators selected did their work with high precision.

Nevertheless the question of the accuracy of the results remains. The singular question is: Did the sample removed from the corner of the Shroud represent the date of the main body of the Shroud?

The Association of Scientists and Scholars International for the Shroud of Turin (ASSIST) therefore believes, along with many other researchers of the Shroud, that further carbon dating tests on samples taken from at least two other sample sites on the main body of the cloth must be performed. Thus, we hold that the medieval date of the Shroud is not scientifically proven.

Before such new tests of the Shroud are carried out we believe more information about the Shroud is necessary. We

therefore would request new tests aimed at gaining new needed data upon which scientists would base future testing decisions.

I. Holography

Very little is known about the Shroud at a microscopic level. Since it is impractical to take the actual cloth into a laboratory we believe it is in the interest of the future science of the Shroud to establish a permanent and microscopic record. ASSIST has previously proposed to create holograms on glass plates. Thus there would be a permanent record for future reference which can be used in a scientific laboratory. We consider holography the next step beyond photography and, like photography, it is non-destructive; it will not damage the Shroud.

II. Physical Examination

A. Forensic Examination:

New, unpublished information about the Shroud appears to reinforce the conclusion published by STURP in 1981 that an actual corpse was wrapped in the cloth of the Shroud. But this new information needs to be verified. In a paper read at the Ferris State University Second Annual Conference on the Humanities, Science and Technology at Big Rapids, Michigan, and in a more recent version of this paper read at Bologna, Italy, new evidence has been offered to suggest that actual markings on the area of the Shroud which wrapped the feet must be interpreted as encompassing an actual corpse and that these markings preserve bloodstains in various biological states from whole blood, to clotted blood, to partial exudate, to nearly pure serum which has run for a distance of about 5 1/4 inches across the cloth.

Since the proposed carbon date for the cloth places the Shroud in the 14th century it is now highly important for science to determine whether or not an actual corpse was wrapped in this cloth. This is why physical forensic examination of the cloth is essential to determine whether or not the original STURP conclusion can be verified.

We therefore suggest that an international body of blood chemists and specialists in the forensic sciences converge on the Shroud for a physical examination of the image on the cloth and that microscopic samples of very specific areas of the cloth be micromanipulated from it for chemical testing. In the case of the area of the Shroud which wrapped the feet we believe there lies the greatest potential for verifying the STURP conclusions and that this testing include a battery of scientific photography (T-Mat film, infrared, possibly ultraviolet, etc.). Specific areas, such as the proposed "serum flow" across the Shroud, should be made objects of close-up photography and photomicrography to provide tools for the interpretation of this feature.

B. Textile Examination:

In preparation for the next round of carbon dating we need to know more about the nature of the textile itself. We

therefore suggest that an international body of textile technologists and textile chemists converge on the Shroud to aid in determining the answers to the many questions which exist about the cloth.

1. What effect did the fire of 1532 have on the cloth; did the "pressure cooker" effect alter the textile in such a way that would affect carbon dating results?
2. What kinds of contaminants are there on (and in) the textile and how do these relate to the fibers of which the cloth is composed?
3. How do the fibers of the "Raes Corner" compare to fibers taken from elsewhere on the Shroud? Answers to this question may shed light on why the three accelerators obtained the results they did.
4. All factors taken together (nature of fibers and chemical characteristics), what sites on the Shroud would be best for selection for future carbon dating?

If an international body of forensic scientists, textile chemists, and other specialists work together under international coordination, we believe that a fresh new body of material can be assembled about the Shroud which will enable future scientists to make proper decisions about how best to conduct further carbon tests of the cloth.

Respectfully submitted,
Paul C. Maloney
Vice President,
General Projects Director,
ASSIST, May 4, 1989"

Prof. Franco TESTORE: "Comments of a Textile Expert on the Sample-taking of 21 April 1988."

SUMMARY: A piece of the Shroud of exactly 300 mg was removed. Tite brought samples of two other linen cloths as controls; each lab received pieces of about 56 mg each. Vial brought bits of thread of c. 68 mg for each lab. The side strip is still something of a mystery: it is 8 cm wide and 380 cm long, while the Shroud is 450 cm long. A pole was inserted in it for display of the Shroud. It may have been sewn on after the image in order to center the image.

Testore addressed the question of preservation. The roller should have a larger diameter to accommodate the thickness of the Shroud plus backing material and patches, which have caused hills and valleys in the whole.

Gabriel VIAL: "Some Observations on the Linen of the Shroud."

SUMMARY: What one sees as two rectangles at the corners of the side strip (14 and 36 cm respectively) is really exposed backing material. He showed by x-rays that the side strip is a part of the original Shroud, cut off for some reason but soon

sewn on exactly in its original place. X-rays showed that irregularities in the weft of the Shroud extend into the side strip.

Vial then discussed numerous other cloths and their weaves which he has been able to observe in historical museums. In every one the material or the weave differs from the Shroud. Three-to-one herringbone is only found in silk cloth. Finally, in a 16th c. linen canvas of the Last Supper in the Hermitage he found a three-to-one linen cloth, but until then no cloth like the Shroud has come to his attention.

The fourth control sample from the cope of St. Louis d'Anjou consisted of threads from the linen backing. It was not three-to-one herringbone. The cope itself is of linen embroidered with silk of herringbone weave. Note it is not a burial cloth.

Prof. Gilbert RAES: "On the Raes Fragment Taken 24 Nov. 1973; the Problem of the Side Strip; the Cotton Fibers Found in the Oxford Shroud Sample."

SUMMARY: Let me clear up some misconceptions about the "Raes Sample." In 1976 David Sox asked me to give it to McCrone. My colleague Prof. Ackers and I were not convinced McCrone could conduct dating tests. I turned the sample over to Gonella.

My sample came from the main Shroud body, but with a small part of the side strip. The latter contains cotton, but the Shroud does not. Thus they are two different cloths; but this needs confirmation. Lately Oxford "rogue" fibers were sent to Derby and identified as cotton.

How unscientific it was that in the face of this important complication in the C-14 process, no experiments were done to determine the type and amount of cotton in the region of the samples. It is regrettable that coordination among specialists was not done. I could have told them what tests to do. Finally, I wish it noted that my cotton fibers were inside the threads.

At this point Prof. G. RIGGI showed his videotape of the taking of the sample from the Shroud. He noted new creases in the cloth and a general darkening of the whole since 1978.

Dr. Jeanette CARDAMONE: "Flax Cellulose: Characterization and Aging."

SUMMARY: After a highly technical description of the characteristics of cellulose, Cardamone described non-destructive methods of determining the exact condition of the Shroud so as to be able to retard future degradation. As a general rule, sunlight and moisture will damage cellulose, so the Shroud should be kept dark and dry. Frequent handling

(stretching, folding, etc.) should be avoided. Flax is already relatively brittle. It will break with only ten per cent extension or stretching and will not easily recover to its original dimensions when the stress is removed. Finally she urged the formation of a scientific archive to which specialists could submit their recommended procedures relating to the Shroud.

Jacques EVIN: "Radiocarbon Dating of the Shroud."

SUMMARY: Wilson does not accept C-14; I differ. Pollution was not a large problem. The two C-14 techniques (counting and accelerator) are complimentary and equally valid. The work on the Shroud was impeccable. This conference cannot set aside the medieval date. Opponents of C-14 must offer solid scientific reasons, not innuendo.

Evin proceeded to give a detailed description of C-14 and its application to the Shroud. He stated that it would take 50 percent modern carbon increment to alter the age of the Shroud by half (roughly 2000 to 1000 years.)

This presentation, from a C-14 specialist who had himself questioned the aberrant C-14 procedures used for the Shroud was quite disturbing to proponents of Shroud authenticity.

Pere J-B. RINAUDO: "The Shroud After C-14: A New Hypothesis."

SUMMARY: In the NATURE article the authors refer to "the obvious conclusion." It would be more scientific to say "the conclusion seems to point to..." The mystery of the cloth is far from obvious. The image forming process, with its astonishing 3-D and negative aspects, is not known and it could be the factor which skewed the date.

For the three controls the error factor is given as 0.1, 1.3, 2.4; but for the Shroud it is 6.4. Moreover, Oxford gave 746 +/- 30, while Zurich gave 676 +/- 24 and Arizona 646 +/- 31. Oxford's results fall cleanly outside and earlier than the two others. This seems to point to Oxford having an older cloth or one with less C-14 than the other two. The cloth of the Shroud seems to contain varying amount of C-14.

Rinaudo commented on the proposal of Dr. Tom Philips of Harvard regarding a neutron flux resulting in energy from an unknown source. If this is correct the Shroud may not lend itself at all to C-14 dating.

The Shroud's Image and Numismatics in Byzantine Culture

by Paul C. Maloney

Preface.

This paper is presented here as one small step in an ongoing attempt to reconstruct the evolution of the Christ Type in Byzantine coins in general and in the Justinian II coins in particular. At this point we must emphasize that there is much work yet to be done. We simply wish to introduce a new piece of evidence into the discussion and suggest an hypothesis which we believe is eminently testable. In turn, if our hypothesis proves sound, we would suggest that it offers a ready explanation for a curious puzzle noted by James Breckenridge in 1959 for which he had no answer.

Introduction: The Problem.

When Secondo Pia photographed the Shroud of Turin at the turn of this century it brought the Shroud into the modern era of scientific investigation. The view expressed by the agnostic Delage before the French Academy was that this was the burial cloth of Christ. Church historians, Chevalier and Thurston, could not accept the verdict. They quickly pointed out that the very earliest document which clearly referred to the Shroud was that of a letter, the D'Arcis Memorandum dated to 1389, which claimed that an artist had admitted painting it some 34 years before-- i.e., around 1357. That now famous memorandum has become the pivotal point of all arguments about the date of the Shroud, the rallying point for skeptics and the sticking point of those who would otherwise accept the cloth as much older.

The Solution.

The ensuing years have witnessed the scholarly exploration of a number of paths to try and fill in the missing 1300 years of "Shroud history" and thereby also establish a date for the Shroud or at least its presence in the period of the item being compared to the Shroud.

The earliest effort was aimed at trying to discover traces of the Shroud image in the realm of earlier artistic traditions. Paul Vignon, a friend of Delage, championed the approach by which he compared the face on the Shroud with details of artistic renditions of Christ such as the famous Edessan Image, Mandylion, and the Veronica. More recently, Ian Wilson, the British Shroud researcher, has picked up Vignon's mantle and has suggested that the Shroud was identical with the Edessan Image and the Mandylion (in a folded-up form so that only the face of Christ was visible to the viewer). These specialists have tried to show the presence, in such early artworks as have been preserved for us, of key features which exist in the Shroud itself.

The second line of investigation was picked up by such scholars as Edward Wuenchel, Alfred O'Rahilly, and others, who dug deeply into the literary resources to attempt to

discover traces which might refer to the Shroud. This has added a complementary dimension to its study.

Work done in 1977 by Drs. John P. Jackson, Eric Jumper, and others, using the VP-8 Image Analyzer, revealed an apparently three-dimensional image encoded on the cloth and suggested the presence of what looked like buttons on the eyes of the Man of the Shroud. Ian Wilson suggested that the size would appear to match that of the lepton of Pontius Pilate. An example of one such lepton was supplied by Atlanta coin dealer Mr. Wilburn Yarbrough to the late Fr. Francis L. Filas of Loyola University in Chicago who energetically pursued this special facet of Shroud research, thus introducing the study of coins into the picture.

Meanwhile, Dr. Alan Whanger of Duke University, and his wife Mary, had developed what is now known as the polarized image overlay technique. They applied this to the Pontius Pilate coin and discovered 74 points of congruence between a Pontius Pilate lepton and the image on the right eye of the Man of the Shroud. The Whangers then applied their technique to the image of Christ on a Byzantine solidus struck between 692 and 695 in the first reign of Justinian II. They found at least 65 points of congruence between this and the face of Christ on the Shroud. Their conclusion was that "this coin was indeed a numismatic icon almost certainly copied from the Edessan image [i.e., the Shroud] as Breckenridge (1959) speculated," (Whanger, 1983:304).

More recently the Italian scholar, Mario Moroni, has traced the development of the Christ image on Byzantine coins to attempt to follow the "sindonic itinerary" from Jerusalem to Constantinople. (Personal communication).

The purpose of this paper is to introduce into this third line of research some information provided by an analysis of a Byzantine tremessis struck by Justinian II in his first reign 685-695 A.D., currently in the collection of Mr. Wilburn Yarbrough of Atlanta, Georgia.

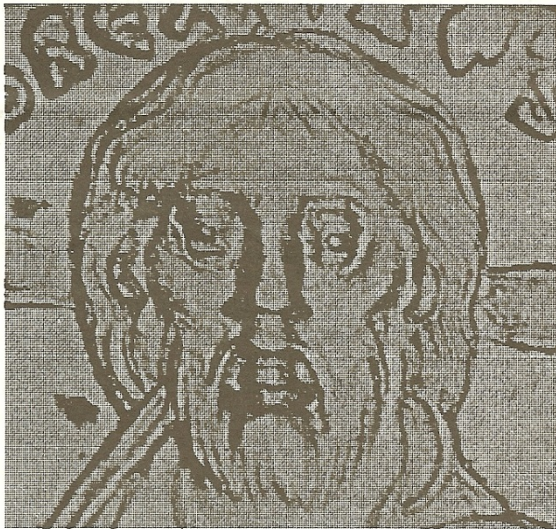


PLATE 1: A solidus of Justinian II (692-695). Note the "naturalistic" presentation of Christ on the obverse as remarked by Philip Whiting. (Photo courtesy of Mr. Wilburn Yarbrough)

The Justinian Coins

"Justinian II was the first Byzantine emperor to place the image of Christ on his regular official coinage. When he took this step, furthermore, he used not one but two quite different representations of the physical appearance of Christ. The precedent thus created was ignored by his successors, however, and the Christ-image disappeared again from the Byzantine coinage for a century and a half..."

Thus read the opening lines of James Breckenridge's classic study which is the watershed of all studies on the Justinian coin types. He has noted the following basic types struck by Justinian II during his two reigns—I will provide only truncated descriptions here:

1. Type I-A: Obverse: Bust of Justinian II, facing, beardless. Reverse: the cross potent on three steps.
2. Type I: Obverse: Bust of Justinian II with full beard and ridge points to the early literature which discussed the matter and writers tended to comment that the curly haired type was more traditional.
3. Type II: Obverse: Bust of Christ, facing, with cross behind head, hair and beard flowing. Reverse: Justinian II, standing, bearded.
4. Type III: Obverse: Bust of Christ, facing, but different facial type, hair with double row of curls, beard short and curly. Reverse: Bust of Justinian II, facing.
5. Type IV: Obverse: Bust of Christ, facing, as on Type III. Reverse: Bust of Justinian II, bearded, on left, and bust of Tiberius, beardless, on right, both facing.
6. Type IV-B: Obverse: Similar to reverse of Type IV. Reverse: Similar to the reverse of Type I.

Breckenridge believes the sequence, although arbitrary, is probably set in chronological order. His Type II is Christ-type A which can be compared with such icons as the famous

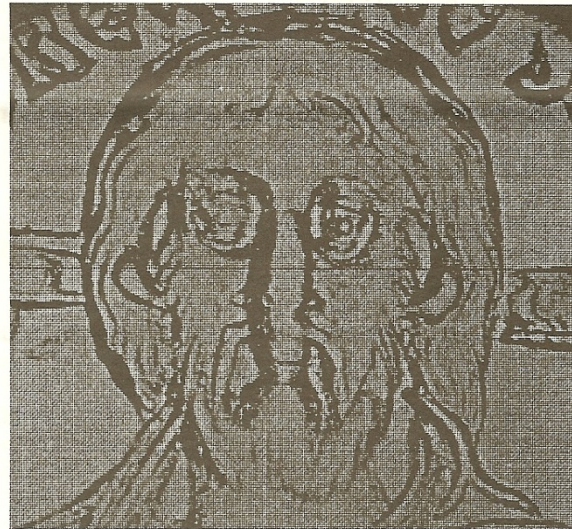


PLATE 2: A second example of the "classical" version, also a solidus from the reign of Justinian II (692-695). (Photo courtesy of Mr. W. Yarbrough).

encaustic Christ Pantocrator, thought by some to have been commissioned by Justinian I, which is at the Monastery of Mt. St. Catherine which he founded in the southern Sinai Peninsula of Egypt.

Our main item of interest in this paper is Christ-type A. Breckenridge says,

"If we look for parallels to this Type A, we find that there are no surviving antecedents in Christian art so far as it has been preserved. Other bearded portraits of Christ of course had appeared long before this date, particularly from the fourth century on, but all lack the distinctive characteristic of Type A: the wavy hair and beard, the rounded head, and the clearly marked part in the hair, from which two tiny locks stray down onto the forehead," (Breckenridge, 1959:46).

Herein lies Breckenridge's puzzle: He looks for a forerunner to this type in the Phidian Zeus with its rounded face, full flowing beard, wavy hair with a strong part in the center, (Breckenridge, 1959:59). But what explains the forelocks?

The fact that Justinian II replaced his earlier commissioned bust of Christ (Type A) with the "Syrian" bust (Type B) demonstrates the controversy current then as to which was the more accepted version of Christ's face. Breckenridge points to early literature which discussed the matter and writers tended to comment that the curly-haired type was more traditional.

The Byzantine Tremessis in the Yarbrough Collection

In 1985 Mr. Wilburn Yarbrough picked up a tremessis of Justinian II which fit into Breckenridge's category of Christ-type A. At first sight it was a poorly rendered version of what we now recognize as the "classical" form of Christ-type A. In fact, Philip Whiting has referred to two types of renderings of facial images among the engravers of Byzantine coins: the "naturalistic" and the "impressionistic," (Whiting, 1973).

The "naturalistic" form was a painstaking attempt to

render the Christ face as realistically as possible. The "impressionistic" was merely a representation of the human form using basic lines. Curiously, the two approaches were sometimes brought together on the same coin. For example, where the Christ-type A was used on the obverse with the impressionistic rendition of the emperor on the reverse. In fact, the lion's share of Byzantine numismatic engravings are of this impressionistic type. The naturalistic Christ-types are the exception rather than the rule in Byzantine imagery. (See plate 1).

How did this "naturalistic" rendition of the Christ-type A develop? It is this question which is the focus of this paper. Early in October, 1987, Mr. Yarbrough called me about a matter related to the study of Byzantine coins. He mentioned having found a Byzantine tremessis which he thought might be pretty close to the Shroud image. At my request he kindly sent me a photograph of the coin. My preliminary analysis of the tremessis was completed on Nov. 1, 1987, a copy of which is included here (See Below). It revealed a series of observations which showed striking similarities with features on the Shroud face. But among these similarities were some features which must be called oddities—especially when this tremessis is compared with the "classical" version which became the most common rendition of Christ-type A.

Each observation from the tremessis will be compared with features on the face on the Shroud. But it is important to note here as we move through the list that everything appears in reverse on the coin as compared with the Shroud. In actual fact, if the engraver designed his die directly from the Shroud, and that die was slavish to the face from the Shroud, everything would be in reverse. And "slavish" is the key word here. If the engraver tried to copy the Shroud face, with its vague suggestion of features we commonly associate with a normal human, as closely as possible because he believed he was using the Christ face as the

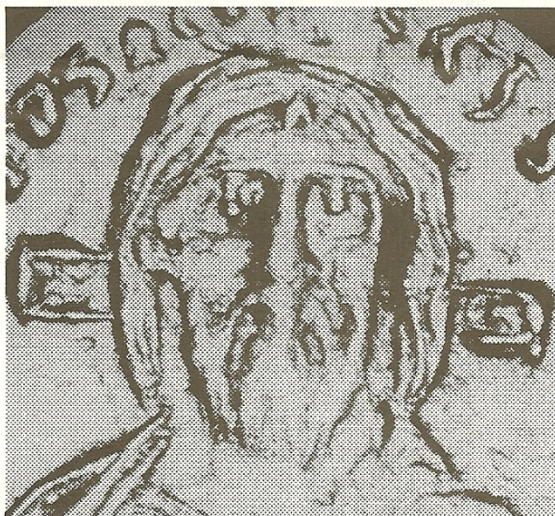


PLATE 3: The Justinian II Tremessis for comparison with the "classical" Christ Type A and the facial image on the Shroud of Turin. (Photo courtesy of Mr. Wilburn Yarbrough).



PLATE 4: The face of the man of the Shroud for comparison with the "classical" rendition of the Justinian II Christ Type A and "primitive" rendition on the Yarbrough tremessis. (Photo courtesy of Holy Shroud Guild).

model, he would be forced to make some decisions in his rendering of that face. If he opted to stay as closely as possible to what he perceived on the Shroud, and did not permit his mental model of the human face to hold sway, then those results must best be described as “slavish”.

Observations

The asterisk(*) marks those items which are so peculiar that we would not expect an artist normally to include them in his rendition of a human face. But a comparison between the Shroud face and the coin helps us to understand their origin: they are the result of an artist who was slavishly dedicated to duplicating the Shroud face on his coin die.

1. Mr. Yarbrough points to the wavy hair on the coin. He has suggested that the wavy lines of the blood might have motivated the engraver to interpret the face as having wavy hair. It should be noted, however, that Christ was portrayed with wavy hair as early as at least 350 A.D. and tradition may have played a role in the engraver's rendition here.
2. The forelocks are unexplained in terms of any of the forerunners which have been suggested. They neither occur on the Syrian type of Christ nor on the Phidian Zeus suggested by Breckenridge. But we may suggest the so-called “epsilon” flow of blood on the forehead as the possible source of the forelocks, thus explaining Breckenridge's puzzle.
3. Both the Shroud and the coin have heavy brow lines.
- *4. There are peculiar lines on the coin connecting the brows with the eye dots. Nothing like these appear on the “classical” version of the Christ-type A. But on the Shroud we can see “flaws” in the cloth which can be interpreted as these very connecting lines (see article on p. 12).
- *5. The eye dots themselves are present on other Christ-type coins. What is peculiar is that eyedots are here without any eyelids. No eyelids can be clearly defined on the Shroud face either.
6. The depressed orbit areas are the engraver's way of depicting light areas on his model. Mr. Yarbrough has pointed out that the very configuration of those sunken areas are reminiscent of those, in reverse, on the Shroud face.
- *7. Note that on the coin the flaring of the nostrils is rendered separately from the moustache. There is a definite space on both the coin and the Shroud image between these nostrils and the moustache.
8. Note the droop of the moustache on the coin and compare this with the dark places on the cloth which can be interpreted as being part of the moustache.
9. Both the beard on the coin and on the Shroud converge with the lower lip. (Observation made by Dr. David Wright). We call this the “pinched mouth effect.”
- *10. The blank space which appears beside the nose on the coin appears on the opposite side on the Shroud face. (Observation made by Wm. Yarbrough).
11. The split beard appears clearly both on the coin and on the Shroud and was one of those features which was retained

on the “classical” version. One tuft of the beard is longer than the other both on the Shroud (left) and on the coin (right).

12. The lines at the neck of the pallium appear to coincide with the two wrinkles on the Shroud. However, there is some question as to the antiquity of these wrinkles.

*13. The neck is barely visible on the coin. On the Shroud the neck is not visible at all. However, there are dark areas on the cloth which could have been interpreted as the outlines of the neck and these are located in places on the Shroud where interpretive lines occur on the tremessis.

14. Notice how the hair interacts with the lines which become the shoulders. The engraver rendered them in such a way that years later, when the engraver for Michael III (842-867) copied Justinian II's Christ-type A, he literally misunderstood the placement of the hair—a feature that was corrected later, (Breckenridge, 1959:47).

*15. The right eye on the coin is lower, matching the left eye which appears lower on the Shroud face, especially when viewed from a distance.

*16. Note the line which transverses the wavy hair and extends into the blank space on the coin. Mr. Yarbrough informs me that this line actually crosses the entire blank space abutting the cheek area. Clearly, the engraver intentionally created what to us appears intrusive. But the line—perhaps a flaw in the cloth itself—crosses the blank space from the cheek through the hair and can even be seen picking up in the cloth beyond the edge of the hair. He suggests that it may be that these lines, inherent in the cloth beyond the head, may have motivated the creation of the cross beams on the coin, especially since similar flaws in the cloth extend above the peak of the head, now somewhat obscured by the waterstains deposited there during the dousing of the fire of 1532.

17. The brief flow of blood near the right-hand shoulder on the Shroud face coincides with the angle line of the shoulder area on the coin.

*18. Mr. Yarbrough has noted that whereas on the right hand side of the coin the browline extends down parallel to the space between the face and hair, on the left hand side of the coin there is no such demarcation; the line extends over to the hair. On the Shroud there is a subtle line of shading in the cloth which could have provided the engraver with the perceptible demarcation rendered on the right side of the coin. There is no similar demarcation on the Shroud face above the swollen cheek.

19. The point of the short tuft of the beard appears to have been spaced comparable to the faint neckline as on the Shroud.

Requiring further study:

*20. What medical observers have interpreted as a swollen cheek (note protrusion of the swollen cheek into the blank space at right side of the Shroud face) appears rendered as a protrusion which invades even the hair on the left of the coin. But in the weave of the cloth one can see a darker coloration

which is to be seen on both sides of the face at a level with the cheek bones. But is this protrusion part of the artist's attempt to portray ears? The feature needs further study.

*21. Both the spaces beside the face on coin and the Shroud are obvious. The spaces seem to be intentionally added by the engraver because they existed in his model. These vanish on "classical" renditions of the Christ-type A. This feature needs further study.

22. It is not clear whether the engraver intended to render ears or not. What does seem apparent is that the engraver placed features in his design which could be interpreted as ears but then erased them. This may suggest that he wished to conform to the Shroud image which has no ears.

Conclusion

We can well imagine that when the engraver had completed what we believe may have been the "primitive" forerunner of Christ-type A the responses to his "slavish" product were quite negative. With the owl-like eyes, spaces between the face and hair, and no apparent ears, the authorities surely turned "thumbs down" and sent him back to redo the engraving. But these same peculiar features on the die would seem to find an explanation in the face of the Man of the Shroud.

We think the peculiarities of the Yarbrough tremessis suggest that the Shroud existed at least as early as the late 7th century A.D. Clearly, Mr. Yarbrough has made an important discovery.

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I would like to acknowledge my profound indebtedness to Mr. Wilburn Yarbrough of Atlanta, Georgia for his constant support in this project. The subject was explored at length during many phone conversations and in numerous letters. The feedback between us resulted in uncovering many important points of detail on the tremessis which is the subject of this paper. Some of these details await further study and have not been incorporated here. In all cases the weaknesses of this paper either in structure or content are mine alone.

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Editor's Note: Please see the related article, "An Examination of the Eye Area of the Yarbrough Tremessis in Comparison with the Shroud," on page 12.

Symposium Scientifique International De Paris Sur Le Linceul De Turin

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The following is Part I of a chronicle of the proceedings of the symposium. Part Two will be published in the next issue of the "The ASSIST Newsletter". Papers read at the symposium are summarized and some of the more notable social and ideological aspects [of which the writer is aware] are indicated.

Preliminary

Visitors to Paris for the symposium were greeted by perfect weather, with temperatures ranging between 75°F and 55°F each day, with no hint of rain.

The symposium was organized largely through the efforts of Dr. Andre van Cauwenberghe (and Mr. George Edel of Wagram Voyages) of Paris and Mrs. Dorothy Crispino of the United States. It was well attended with over 225 participants from all over the globe and over thirty-five presentations by scientists and scholars representing the lengthy catalog of specialties relevant to sindonology. The proceedings were simultaneously translated in English and French.

A tone of controversy was struck immediately at the start of the meeting of the first day. As participants arrived on September 7, they were met on the sidewalk by young people distributing free copies of "The Catholic Counter-Reformation," the publication which features the sindonological research and opinions of Bro. Bruno Bonnet-Eymard. The issues contained his charges of fraud and sample-switching against Edward Hall, Luigi Gonella, and even Cardinal Ballestrero. It was surprising that, despite having been refuted, the controversy was still very much alive in Paris.

Inside, Shroud scholars renewed old acquaintances or "finally met" others whom they had previously known only by their published work. A bookstall was provided for the sale of Shroud publications.

In general, the symposium was well planned, the schedule was quite full, and the quality of presentations was impressive. Some papers were allocated more time than others, which caused confusion for some members of the audience who expected each presentation to last twenty minutes.

The moderators each served one day: M. Souverain on the 7th and M. De Carbon on the 8th. M. van Cauwenberghe opened the proceedings with welcoming remarks.

TRAILBLAZERS

Mme. COIGNERAI-DEVILLERS: "Yves Delage, First Interpreter of the Photographs of the Holy Shroud in 1902." SUMMARY: This grand-daughter of Delage presented an intimate family review of Delage's life and work, then noted

his place in Shroud science. An agnostic, he was the first scientist to study the Shroud from Pia's photographs of 1898. His address before the French Academie des Sciences (April 21, 1902) proclaimed by all odds that the Shroud was Christ's. The Academie refused to publish his paper in its *Proceedings*. He was the first to formulate the theory that sweat and aloes may have produced a photographic image on the Shroud. He always emphasized that he was speaking of Jesus the man, and no more. He later complained that religion had clouded up a scientific question, and that there would be no uproar had it been a question of Alexander the Great.

Msr. A. LEGRAND: "From Vignon to the Present."
SUMMARY: Legrand recounted highlights of his 75 years in sindonology. His first lecture, using Pia's photographs, was in 1928. In 1933, he examined the Shroud with Vignon, who in his later years had abandoned the ammonia-vapor theory. After 1950 Vignon no longer lectured on the Shroud. Vignon was increasingly taken by the question of how the corpse was removed without disturbing the bloodstains. How, Legrand asks, was it done in the Middle Ages?

Legrand was present when Chevalier introduced the first D'Arcis documents. He welcomes the C-14 dating as another challenge to Shroud science. Cardinal Ballestrero's remark, "The Church does not accept the results with closed eyes," was too little publicized. The Pope has now called it a relic. Cardinal Saldarini, Ballestrero's replacement in Turin, said Mass on May 4 in the Shroud Chapel. He has also called for interdisciplinary research done freely and cooperatively.

Mrs. DOROTHY CRISPINO: "Going to Paris..."
SUMMARY: Warmly applauded, Mrs. Crispino related her views on the preparations for the symposium, the significance of the symposium in its historical context, and conveyed the greetings and prayers of Fr. Peter Rinaldi who was unable to attend.

LUIGI GONELLA: "Twenty Years of Science"
SUMMARY: On the defensive, as expected, Gonella made it clear that he was not chosen as Shroud overseer by Cardinal Ballestrero, but by his colleagues at the Polytechnic. Gonella began by stating that his first responsibility is conservation of the Shroud, and that depends on the mechanism of the image. Those who urge various new scientific tests should remember that the Shroud is "private property," and that he still makes the final decision. As for the C-14 dating, he said that his office only knew the results after three months, that is, at the end of September. He had been accused by the press et al of delaying in order to get the labs to change their date! This was so because of the "leaks." All thought surely he must know if the leakers "knew."

HISTORY

Prof. GINO ZANINOTTO: "A First-Century Crucifixion at Jerusalem: Johanan ben Hagqwl."

SUMMARY: Fragments of tablets have turned up which give instructions for crucifixion of freemen and slaves. These have altered earlier views of crucifixion in Jerusalem. He described the well-known burial of Johanan found in 1968, with its crucifragium and forearm erosions. The place, time, and social setting (family tomb of a free citizen in first c. Jerusalem) allow comparison with New Testament accounts. The same details are seen on the graffito of Pozzuoli, also first c. Nailing in the wrists is a precise mark of Roman crucifixion. Add the Shroud and we have three cases with similar details and for the same period. In the third century we get variants, and in the fourth c. the cross is replaced by the "fork." It is in the seventh c., when Arabs practiced crucifixion, that the realism of Roman crucifixions was effaced from the memory of Christians and Christ was represented with nails in the palms. If the Shroud is a fake, it is a first-century fake.

ZANINOTTO: "Was the Sermon of Archdeacon Gregory in 944 an Early Recognition of the Shroud?"

SUMMARY: He personally found this manuscript. It suggests that on its arrival in Constantinople the Edessa cloth bore a full-length image of Christ by referring to the bloody side-wound.

Mme. REGINE PERNOUD: "The Holy Shroud in Historical Tradition."

SUMMARY: She reviewed the important documents found by Chevalier. He would not accept Pia's photos because he restricted himself to written documents. Still we owe him a great debt.

Mme. Pernoud next reviewed numerous documents from periods earlier than the 14th c. which Chevalier did not use. These texts replace Chevalier's notion of a relic suddenly appearing in the 14th c. with one known and venerated already for centuries. [These texts are thoroughly reviewed in Dubarle, *Histoire ancienne du Linceul de Turin* and in Scavone, *The Shroud of Turin: Opposing Viewpoints*].

M. A. LEGRAND: "What the Byzantines Saw and Copied."

SUMMARY: In any attempt to date the Shroud by iconography, we must ask what Byzantine artists would have been able to see. He pointed out to Vignon the similarity of Byzantine icons to the Shroud. He said that he was immediately struck by the bloodstains rendered as wisps of hair. He accepts the clarity of the nose, hair, beard in two points, and herringbone weave.

Legrand asks how can we expect Byzantine artists to have seen forty points of detail on the Shroud face? He stated that some friends of the Shroud are more dangerous than its enemies. He also said that two unchallengeable marks are preferable to forty challenged and uncertain.

LeGrand went on to emphasize the forehead blood and weave as pervasive in examples of Byzantine coinage and icons as evidence of the Shroud's early presence. His opinion is that the sidestrip comprised the Biblical othonia stitched or restitched to the Shroud for preservation.

Don LUIGI FOSSATI: "Documentary Value of Shroud Copies."

(Read by Dorothy Crispino).

SUMMARY: There are fifty copies made after 1506 which have the same dimensions as the original. These are the subject of the paper. Twenty-seven are dated. Those made directly from the Shroud at times of expositions state so in Latin. Some assert they touched or were laid upon the original. All but four place the wound in the palm, two place it in both hands. Though no crown of thorns appears on the Shroud, most artists show a wreath. The epsilon flow is not represented. The feet are crossed or parallel. The negative Shroud features were never realized by artists of the 16th-18th centuries. The Shroud is inimitable by a "pictor."

IAN WILSON: "Art-Historical Indications for the Shroud's Existence Prior to the 14th Century."

SUMMARY: Wilson received applause for his opposition to Bro. Bruno's assault on the honesty surrounding the C-14 testing. He alluded to the coincidence of the D'Arcis letter appearing exactly 600 years ago, and in archives of Paris itself. Representations of blood in 15th c. medical textbooks or in Gruewald's most realistic paintings are "light-years" removed from the pathological accuracy of the Shroud blood. From the 900's Constantinople held an *acheiropoietos* image of Christ's whole body. He cited Gregory the archdeacon, Ordericus Vitalia *threnoi*, and *epitaphioi*. Was the Shroud the original of these? As evidence he cited the lidless box and inverted triangle at the bridge of the nose on so many Christ-faces.

Against C-14, Wilson noted the discrepancies in dating the Lindow Man unearthed in Cheshire in 1984: By the conventional method, Harwell Lab dated it at 300 B.C. but by the accelerator, at 500 A.D. Oxford's accelerator date was consistently 300 A.D., even when it dated the Harwell samples. Conclusion: C-14 is not infallible.

PAUL GASTIEAU: "The Three-dimensional Image."
(Read by M. Marshall.)

SUMMARY: LeGrand first had the idea of testing the Shroud for its three-dimensional properties. Gastineau's invention made possible the first 3-D study of the Shroud in 1974. He described his technique in detail. Three-dimensionality refutes any direct image application hypothesis, such as painting, but does not prove authenticity.

Dr. FREDERICK ZUGIBE: "Pierre Barbet Revisited."

SUMMARY: Zugibe effectively critiqued three major hypotheses of Barbet:

1. The Man of the Shroud was nailed on the thumb side of

the wrist, while Destot's Space is on the little finger side.

2. Zugibe showed that the median nerve does not pass through Destot's Space, and that the thumb is naturally behind the first finger.

3. Zugibe's experiments with bodies on a cross showed:

- a high rate of perspiration ("a puddle") after only six minutes;

- an initial 5-6 times hyperventilation rate which pushed oxygen levels up;

- but, even after 45 minutes on the cross, pulse, oxygen, breathing, and blood pressure were not abnormally changed;

- the position of the person on the cross is arched. When the subject pushed his body up, there was no change in the angle of the arms, but a bend at the elbow. (The square nail would not have allowed much rotation in the hands);

- Death was not caused by asphyxiation, but by the cumulative traumatic shock beginning with the Gethsemene experience and mounting to hypovolemia on the cross.

News and Notes:

A meeting of administrators from many of the major sindonological groups throughout the world was held in Paris, September 9th, 1989. The group believes there is a need to evaluate future research proposals for testing the Shroud. More details about this important new international body will be presented in a future issue of "The ASSIST Newsletter."

Conferences on the Shroud of Turin

A major conference on sindonology, to be held in Westchester Co., N.Y., is planned for September, 1990. The conference is being sponsored by a private donor and will be open to the general public. Those invited to speak include: Dr. Alan Adler, Fr. Albert R. Dreisbach, Dr. John Jackson, Mr. Paul Maloney, Fr. Adam Otterbein, Fr. Peter Rinaldi, Dr. Alan Whanger, and Mr. Ian Wilson. One goal of the conference is to present for the public the state of research on the Shroud in the wake of the C-14 testing. The organizers are anticipating a large audience.

Editor's Note:

Due to the difficulties involved in beginning a new publication, the present issue of the newsletter was delayed. ASSIST wishes to apologize to our readers for this delay. We are hoping that "The ASSIST Newsletter" will ultimately reach our goal of four issues per year. We wish to thank those who have made a contribution and become new members of ASSIST for their part in making this publication possible.

Correction:

The date of the premier issue of "The ASSIST Newsletter" was inadvertently omitted. The date was June, 1989.

An Examination of the Eye Area on the Yarbrough Tremessis In Comparison with the Shroud

Compare the Yarbrough tremessis eye area with the same area on the Shroud face. (See photograph on page 7). Note the round eye dots. There are no eyelids. The classic coin has eyelids. But note especially the line connecting the eye dots on the coin to the eyebrows above. The engraver has intentionally engraved these lines connecting the eye dots to the brows. Why? If the Shroud face was his model there is a ready explanation.

If the engraver worked his die looking directly at his Shroud model then struck the coin, everything is in reverse. The longer tuft of the split beard is to the left on the Shroud, to the right on the coin (hence to the left on the coin die

also). Note the lack of ears on both the Shroud face and on the Yarbrough tremessis. The classic coin has developed ears and the space between the face and the hair on both the Shroud and Yarbrough tremessis has been filled in with the beard on the classic coin.

We have therefore suggested that the Yarbrough tremessis represents a primitive stage of development for the Justinian II Type A. We further conclude that this evolution of the Christ-Type A began on the fractional currency (tremessis), continued onto the semissis (the semissis has no lower eyelids) and reached full development on the solidus.

The photos below are enlarged left and right eye areas. Note the defects in the cloth warp indicated by the "∧". The engraver appears to have tried to duplicate not only the "owl-like" eyes but also the defects in the weave connecting them to the eyebrows.

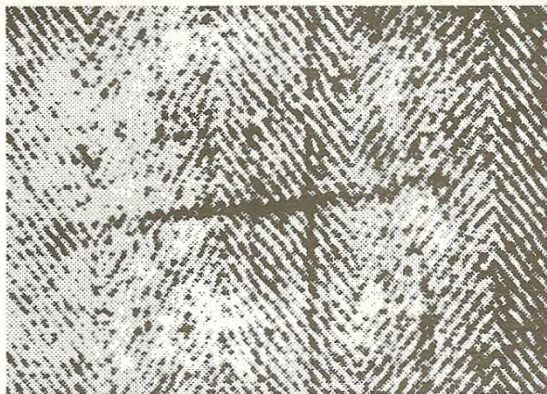


Right Side

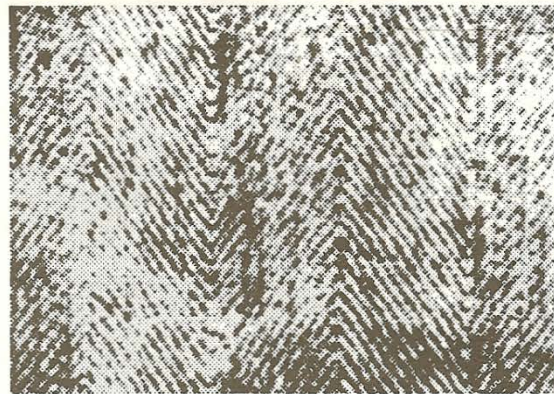
Left Side

Shroud Eye Area Image.

At left is the facial area of the Shroud image. Note the vertical lines inherent in the cloth extending through the two eye areas. The two photos above are enlargements of these areas. (Courtesy of the Holy Shroud Guild).



Right eye area: Again, there is a vertical line inherent in the Shroud which corresponds to the strange line in the Yarbrough tremessis.



Left eye area: Note the vertical defect in the Shroud weave and compare with the markings on the Yarbrough tremessis.