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**EXPERIMENTAL RESULTS OF
SUNLIGHT ACTING ON LINEN FABRICS
after a report on
Nathan Wilson's "Shadow Theory"**

THE THIRD DALLAS INTERNATIONAL CONFERENCE
ON THE SHROUD OF TURIN: DALLAS, TEXAS, SEPTEMBER 8-11, 2005

<http://dsc.discovery.com/news/briefs/20050228/shroud.html>

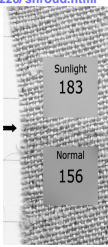
Wilson: "Wherever light paint had been applied, the linen remained dark beneath."

Wilson claims to have used crude flax fabric, but he provided no control samples.

The linen remains dark beneath if it is seen in visible light, but no (or slight) differences appear if it is seen in UV (UltraViolet) light.

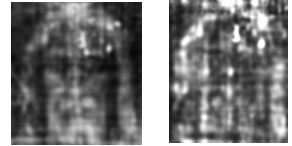
On the other hand, it is known that the body image of the Shroud is better visible in UV light.

Crude flax fabric exposed by G. Fanti to sunlight for 80 hours:
luminance levels ranging from 0 (black) to 255 (white)



<http://stacks.iop.org/f1464-4258/6/491>;
<http://www.sindone.info/FANTL.PDF>
THE DOUBLE SUPERFICIALITY OF THE FRONT IMAGE OF
THE TURIN SHROUD
Giulio Fanti, Roberto Maggiolo

There is a superficial and fainter image on the back side of the Shroud.



Front

Back

Produced in collaboration with:

**SHROUDSCIENCE GROUP
ON YAHOO!**

Group composed of more than 80 scholars that make scientific studies on the Turin Shroud, and is open to all who want to contribute to discover the Truth in reference to the most important Relic of Christianity in the world.

Nathan Wilson states that:
(<http://dsc.discovery.com/news/briefs/20050228/shroud.html>)

"THE RESULT IS A NEGATIVE IMAGE
THAT HAS ENCODED 3D DATA".



The Original Painting

10-Day Image Positive and Negative

RESULTS OF EXPERIMENTS MADE BY G. FANTI

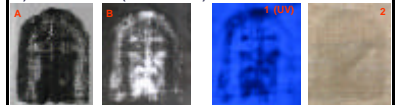
Many flax fabrics of different kind, covered by glass plates were exposed to sunlight for more than 9 days.

The glass plates have:

- A) dark image (face) on transparent background or
- B) transparent image (face) on dark background.

The flax fabrics are composed of:

- 1) new flax bleached;
- 2) new crude flax (not bleached).



Wilson's experiment was featured in an article on the Discovery Channel's Web site on March 4, 2005:
<http://dsc.discovery.com/news/briefs/20050228/shroud.html>

"Wilson put fabric under a glass panel painted with a human face — using white paint — and left it in the sun, for a few days."

Wilson: "Wherever light paint had been applied, the linen remained dark beneath, and wherever the darker shade of linen had been left bare, the image lightened. In this regard, the image produced is very similar to that of the Turin Shroud."

Wilson: "What I have demonstrated is that in order to produce an image like the one on the shroud [sic], nothing more is required than the cloth itself, and a painting on glass."

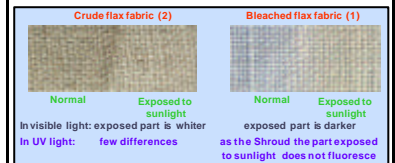
<http://dsc.discovery.com/news/briefs/20050228/shroud.html>

"He [Wilson] believes that his method is consistent with the latest shroud studies [sic], such as that one on the double superficiality of the shroud"

"In a study published last year in one of the journals of the Institute of Physics, the Journal of Optics A: Pure and Applied Optics, Giulio Fanti, professor of Mechanical and Thermic Measurements at Padua University, claimed that enhancing imaging procedures revealed the image of a man's face on the reverse side of the shroud."

RESULTS OF EXPERIMENTS MADE BY G. FANTI

If exposed for more than 9 days of sunlight:
- crude flax fabric (A2) becomes whiter if it is seen in visible light but shows few changes if it is seen in UV light;
- bleached flax fabric (B1) becomes darker if it is seen in visible light and it is much more dark if it is seen in UV light;
- In some cases bleached flax (B1) shows no changes



In visible light: exposed part is whiter

In UV light: few differences

exposed part is darker

as the Shroud the part exposed to sunlight does not fluoresce

EXPERIMENT B1

If a new bleached linen fabric is exposed for 10 days to sunlight it makes yellow but the part masked (by sticky tapes in this experiment) remains whiter.

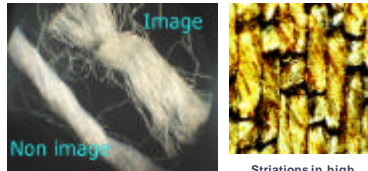


Black and white sticky tapes posed on a glass over a linen sheet.

Resulting linen sheet after sunlight exposure: transparent glass makes the fabric yellow.

RESULT 2 OF B1: the image is not superficial, it passes through all the linen fibers

(If the fabric thickness is similar to that of the Shroud = 0.34 mm)



Linen yarns after 20 days of sunlight: ALL the fibers are colored.

Striations in high contrast eye image of the Shroud.
M. Evans STURP-ME-20.

EXPERIMENT A2

If a new crude flax linen fabric is exposed for 10 days to sunlight it makes whiter but the part masked (by toner in this experiment) remains dark as the original fabric.

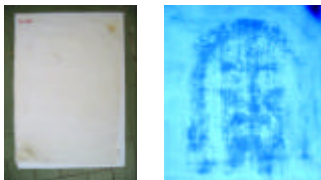


Hard-copy of Face on transparent film put on a glass

Resulting linen sheet after sunlight exposure: transparent glass makes the fabric whiter.

RESULT 1 OF B1: effect of ultraviolet light

After 20 days of sunlight



Face is not easy to detect in visible light

Face is easy to see in ultraviolet light

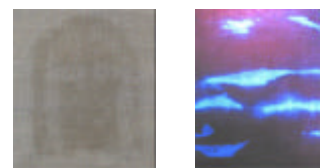
RESULT 3 OF B1: the resolution is better than that of the Shroud (=4.9±0.5 mm).



To determine the resolution, some sticky tapes (thickness=15 mm) were placed over the glass (photo 1). The linen fabric under the glass, exposed to 10 days of sunlight, darkened where there were no tapes (photo 2). The same fabric, seen in ultraviolet light, shows the resolution of about 1 mm (photo 3).

RESULT 1 OF A2: effect of ultraviolet light

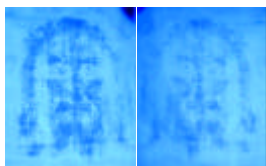
After 20 days of sunlight



Face is easy to detect in visible light

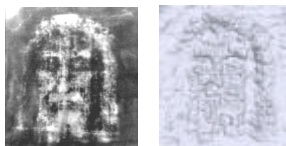
Face is not easy to see in UV light. Some defects (horizontal bands) appeared after some days of exposure to sunlight and rain.

RESULT 2 OF B1: the image is not superficial, it passes through all the linen fibers even if it is fainter on the back side.



Front UV light Back After 20 days of sunlight

RESULT 4 OF B1: the resulting image has 3-D characteristics

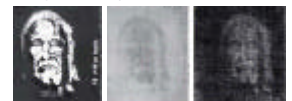


On the left, negative image of Result 2; on the right a 3-D rendering.

HYPOTHESIS made by M. Alonso

O₂ from the air combined with UV light burn the surface impurities slightly bleaching the crude fabric, but in the long term the cellulose itself is attacked and the flax may become dark.
Perhaps Wilson used modern sized linen, not clean.

Nathan Wilson: <http://dsc.discovery.com/news/briefs/20050228shroud.html>



The Original Painting 10-Day Image Positive and Negative

CONCLUSIONS

Nathan Wilson's "Shadow Theory" is a technique able to reproduce some characteristics of the Shroud as: negative image, 3-D features and resolution better than 4.9 ± 0.5 mm (of the Shroud), but it is not able to reproduce: the spectral response in ultraviolet light of Shroud image, unless a bleached flax fabric is used; a superficial image, because the radiated light acts in too long a time, and the striations, typical of Shroud image yarns, that could be obtained using a corona discharge technique.

A future chemical analysis is necessary to better explain why some kind of flax fabrics become bright and other dark if they are exposed to sunlight.

Shadow/Bleaching Technique is interesting. It could reach also the superficiality if the same amount of sunlight radiation was concentrated in a fraction of second.

NOTE

Nathan Wilson's "Shadow Theory" is a technique that can not be attributed to a Middle Age artist because, a part from the problem of the spectral response in UV band, the superficiality and the striations of linen yarns:

- *there are many difficulties in reproducing the very particular blood and serum stains impressed by a corpse on the sheet prior to the body image formation;*
- *it should be explained why an hypothetical artist was so able to reproduce many physical details of the human body, but he painted other details in a very distorted manner;*
- *it was not easy to manufacture glass sheets larger than 4 m before the late 18th century (B. Schwartz & J.N. Lupia).*