A New Look at the Validity of the C-14 Dating of The Shroud of Turin
University of Arizona in Tucson, Swiss Federal Institute of Technology, University of Oxford, England
Problems with C-14 Dating
Sue Benford
and Invisible Stitching
The Raes and RadioCarbon Sampling Area
Cotton amidst Linen
Summary of Shroud FTIR Analysis
Ray Rogers, Sue Benford, Barrie Schwortz
My involvement in The Shroud of Turin
Instrumental Capabilities
MKRDF---FTIR--
-TOF-SIMS---
XPS
Cotton/Linen
Vanillin
Pure Fe, Ion-Exchange Ca,Sr
Dirt in Shroud, Aragonite, Calcite, Damascus Gate, other Tombs
Struthium, Soapwort, Saponaria Officinalis, Blood Retention of Red Color
The Pray Manuscript Preceded C-14 Dating by 67 to 197 years
The Conclusion
Elemental Images
Elemental Images

[Image: Elemental Images]
Shroud Fiber Spectra

![Graph showing Shroud Fiber Spectra with peaks labeled for Rh x-ray tube scatter, K, Ca, S, Si, P, Al, Fe, and intensity (counts) on the y-axis and energy (keV) on the x-axis.]

- Rh x-ray tube scatter
- K, Ca, S, Si, P, Al, Fe
- Intensity (counts)
- Energy (keV)
## Calculated Composition

No Standards Wt%  

<table>
<thead>
<tr>
<th>Element</th>
<th>Composite</th>
<th>Multifiber thread</th>
<th>Si hot spot</th>
<th>Fe hot spot</th>
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<tbody>
<tr>
<td>Si</td>
<td>2.1</td>
<td>0.81</td>
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<td>P</td>
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<td>S</td>
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<td>1.15</td>
<td>2.09</td>
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<td>K</td>
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<td>Ca</td>
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<td>Fe</td>
<td>4.4</td>
<td>2.19</td>
<td>5.67</td>
<td>29.36</td>
</tr>
</tbody>
</table>
Results

- Fibers appear to be plant based due to elemental composition, possible cotton or similar fiber type
- Heterogeneous composition with apparent elemental hot spots
Figure 2: Infrared ATR spectra of the plant fibres recorded over the range 4000 – 750 cm\(^{-1}\).
Negative Secondary Ions

Jerusalem Limestone

Limestone on Shroud Fibers

Counts/Channel

Channel Number 1000

M/e