It was an enormous privilege to attend the St Lewis Shroud conference and to meet so many of the world’s greatest Shroud experts. Can I give my congratulations to the organisers. The comments below are based on some of the conversations I had at the conference.

I am very grateful to Joe Marino for allowing me to present the Oxford photographs and Donna Campbell’s report, to Barrie Schwortz for finding the information online and to Russ Breault for recording the conference. Donna Campbell wrote: ‘there are signs in the Shroud sample that direct the notion of mending or reweaving of the actual woven fabric.’ One of the items mentioned in the presentation was the large black thread which is visible on the Oxford and Arizona samples. A comparison was made with the small black and large white threads also present.

I was delighted to discover from Emanuela Marinelli and Will Meacham that the large black thread was probably stitched in 1694 by Bl Sebastian Valfrè. The invisible reweave hypothesis of Joe Marino and Sue Benford supported by Donna Campbell may refer to two or three different episodes of stitch repair and Bl Sebastian’s repair was one episode. The best demonstration of invisible reweave (both French and in-weaving) I have seen is by the company Without a Trace and can be seen in the video: https://www.youtube.com/watch?v=EIgC_IeuzKE. Please look at that before continuing! The black thread also points to the possibility that the corner strands were unravelled, re woven back together and then stitched back into place with reweaving techniques. Below is the large black thread seen in the Oxford and Arizona photographs see: https://archdams.arch.ox.ac.uk/?c=1203&k=1bcdc90a8b http://www.shroud.com/pdfs/arizona.pdf. *Investigating a Dated piece of the Shroud of Turin, Radiocarbon, 52, 2010.*
Emanuela Marinelli told me that Blessed Sebastian Valfrè caused the nuns considerable grief by insisting on stitching in black. They felt it reflected badly on them. She sent the following excerpt: ‘Nel 1694 il Beato Sebastiano Valfrè, devotissimo della Sindone, ricucì con filo nero, in modo piuttosto maledesto, alcuni rappezzi, specialmente nella zona della ferita al costato.’ Roughly translated into English it reads: In 1694 the Blessed Sebastian Valfrè, devout of the Shroud, stitched with black thread, in a rather clumsy way, some patches, especially in the area of the wound to the chest. http://www.unionecatechisti.it/Testi/Unione/Docum/EvAmore/20.htm. His sewing also appears to have extended to the edge areas of the Shroud, seen in the Oxford and Arizona photographs.

Will Meacham sent this excerpt from his book The Rape of the Turin Shroud p137-138:

It has also been said that there is no record of any repair to that area. This is not entirely correct. One of the people known to have made some repairs to the cloth was the Venerable Sebastiano Valfre (1650-1718). A 19th century book on the life of Valfre (Kerr 1896), gives this description:

Sebastian had a great devotion to the Shroud of Turin and would visit it every Friday if at all possible. When the relic of Christ’s Passion was moved to the Guarini Chapel in the Cathedral of Turin in 1694, Victor Amadeus asked Sebastian to sew on a backing cloth and to mend it in several places. This gave Sebastian many hours with the Shroud during which he gave free rein to his devotion. [It was said that] Blessed Sebastian knelt for hours as he did his work, speechless and with the tears flowing down his cheeks.

During these “many hours,” could he have effected a perfect repair to the corner where the C-14 sample came from? An Italian work on Valfre (Lanza 1898) gives this fascinating detail: “… near the edges of the cloth certain areas were unraveling … Valfre repaired the unravelings between the border and the cloth of the Shroud.” The Italian text (fra l’orlo e la tela della ss. sindone) has exactly the same meaning and is equally obscure as
Blessed Sebastian’s devotion to the Shroud was very great and he is reported to have written:

_The Cross received the living Jesus and gave Him back to us dead;_  
_the Shroud received the dead Jesus and restored Him to us alive._

It is highly probable that the large black threads visible on the Oxford and Arizona samples are fragmentary evidence of Bl Sebastian’s work to repair the cloth at the edges in 1694. Perhaps even evidence of an unravelling of the corner area taken for radiocarbon date.
2. The stitch count on the sample areas
The Oxford and the Arizona samples examined by textile experts Donna Campbell and Rachel Freer-Waters established that the samples have a stitch count of 70 stitches per cm². Both textile experts independently gave the same count. This is not consistent with the rest of the Shroud which appears to have a lower stitch count (around 60-65). The different measurements between the Arizona sample and other stitch counts of the body of the Shroud has been documented by Mark Oxley http://www.shroud.com/pdfs/oxley.pdf : Page 9.

3. The depth of the sample
At the conference John Jackson suggested exploring the depth of the samples. Professor Ramsey confirmed to Hugh Farey that Oxford used all the material: http://shroudstory.com/2013/05/07/an-email-from-professor-christopher-ramsey/. So the only known depth of the sample material is based on the Arizona measurements of 250 microns. This is around a third less than the depth of the Shroud measured by John Jackson 318-391 microns. http://www.shroud.com/pdfs/oxley.pdf Page 9.

Why do the samples have too many stitches and not enough depth? Is unravelling and reweaving the only plausible explanation? The erroneous depth of the Arizona sample includes the multiple white stitching threads which can be seen on the reverse, so the Shroud fibres are even more reduced than they ought to be. Was the Shroud yarn de-gloved or the surface removed at some point after it was unravelled?
Importance of unravelling of the edges.

1. Contaminants

The significance of unravelling is that it is impossible to know what contaminants were added to the fibres before it was rewoven. Donna Campbell wrote that the areas with a different weft and warp interlacement ‘could contain different fibres with different characteristics.’ Ray Rogers identified cotton fibres spiced into a linen yarn confirmed by Robert Villereal. These cotton fibres were held in place with a crust of terpene. At the conference Robert described to me how the laboratory spent a considerable time examining the crust to determine the presence of terpene. If the terpene solution was a pine oil disinfectant, its gluey nature will have stick fibres to the Shroud material. Once the new contaminants are rewoven they become tied into the new material by the weave process and the stitches. They would not be removed by pre-treatment cleaning.

2. The Crimp Factor

If the Shroud was unravelling in the corners in 1694 it may be because it had been unravelled before that date. The crimp factor in linen manufacture means that a material learns the pattern into which it is woven. If it is unravelled then the kinks in the yarns remain and when the material is rewoven the threads try and return to their previous curves. So the fabric unwinds and may need to be stitched to hold it back into place.

3. The White Stitches

I have often wondered how anyone allowed the ugly black stitches in the chest area of the Shroud. However, the fact they were done by such a holy man as Bl Sebastian makes sense of their presence. Now I am grateful to Bl Sebastian because the black thread in the radiocarbon date samples gives us a means of comparison with the numerous white stitches that also appear on the photographs. The white stitches are much more professionally done and blend into the samples. They probably represent a later repair than 1694. They constitute a significant invisible reweave contaminant. There are probably far more stitches below the surface than are visible on the top; that is the purpose of invisible reweave as the Without a Trace video demonstrates: https://www.youtube.com/watch?v=ElgC_IeuzKE.
Conclusions

The Oxford and Arizona samples both contain evidence of stitching with a large black thread and it is likely these stitches are the remnant of the repair of the Shroud by Bl Sebastian Valfrè in 1694. An artistic image of the repair work adds further confirmation. The historical evidence of Lanza (1898) suggests that the repair of the edges involved unravelling of the Shroud. This is borne out by the Shroud sample photographs. To repeat Donna Campbell and Thomas Ferguson Irish Linen’s findings: ‘from the sample it is clear that the fabric of the Shroud is not uniform.’ ‘there are signs in the Shroud sample that direct the notion of mending or reweaving of the actual woven fabric.’ To this we can add the unusual stitch count (70 per cm2) and insufficient depth (250 microns). Bl Sebastian’s repair in 1694 was by no means the only repair: we must also consider the much more extensive white threads.

For any radiocarbon date to be reliable the samples taken need to be representative of the whole. Can we honestly say the samples tested in 1988 were representative of the Shroud of Turin?