"[1] Giulio Fanti[2] studied many fibers and threads[3] coming from the TS (Turin Shroud); in particular fibers coming from dusts vacuumed from the back of the TS in correspondence of Face, Hands, Buttocks, Feet and 1988/C-14 area were compared among them and with threads coming from the 1988/C-14 area (in proximity of the "Riserva" sample).

As it is reported in a recent paper[4], there are cotton fibers mixed with the TS linen fibers in the vacuumed dusts but many on them originate from the cotton contained in the filter where the dusts were collected. It is therefore not easy to affirm if there are cotton fibers coming from the TS studying these vacuumed dusts.

Also in STURP-3AF sticky tape taken from R. Rogers in the middle finger area, frontal TS image, is present a cotton fiber, but it is not clear if this fiber really comes from the TS or from an external contaminant[5].

For this reason G. Fanti was allowed to study the possible presence of cotton fibers in some TS threads coming from the 1988/C-14 area. From a first sight, looking at an optical microscope at 150x-600x no cotton fibers, such to hypothesize an external contamination, were easy to see on the threads surface.

The extremity of a weft TS thread (Figure F1) coming from the 1988/C-14 area, classified as F15001, was then cut to detect the possible presence of cotton among the linen fibers. The thread has a mean diameter of 0.28 mm and it is composed of 188 ±5 fibers.

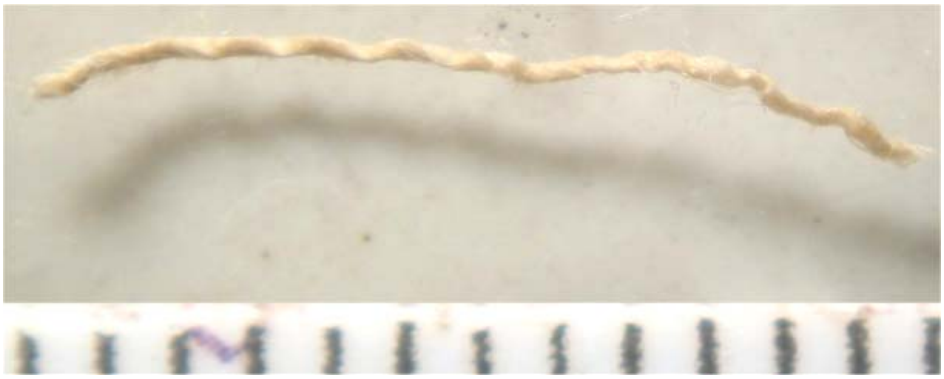

Figure F1. F15001 TS weft thread used to test the presence of cotton fibers (© G. Fanti).

Paraffin was used to take all the fibers together during the cut and then n-Hexane ($CH_3(CH_2)4CH_3$) was employed to dissolve the paraffin at 100-150 °C (the sample was on a microscope glass under its cover glass). The TS fibers of this section were photographed both in visible light and in cross-polarization at extinction and the results are reported in Figure F2 and F3.

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[1] Manuscript sent by G. Fanti to T. Heimburger on April 2009.

[2] Giulio Fanti is associate professor of Mechanical and Thermic Measurements at the Department of Mechanical Engineering, University of Padua, Via Venezia 1, 35137 Padua - Italy, e-mail: giulio.fanti@unipd.it, web: www.dim.unipd.it/fanti

[3] The origin of the TS samples is covered by reserve; if it will be the case, the author will show the documented origin on request.

[4] G. Fanti, R. Basso: "Statistical analysis of dusts taken from different areas of the Turin Shroud", International Conference on the Shroud of Turin "Perspectives of a Multifaceted Enigma", Columbus, Ohio, USA, August 14-17, 2008, http://www.ohioshroudconference.com/papers.htm

[5] It is known that the sticky tapes from the TS sampled by R. Rogers in a clean box (without allowing that the tape with fibers was in contact with a microscope glass) were given to W. McCrone who pressed the tapes on the glasses and allowed his students to examine them; it is not therefore clear to which kind of pollution the tapes were exposed.

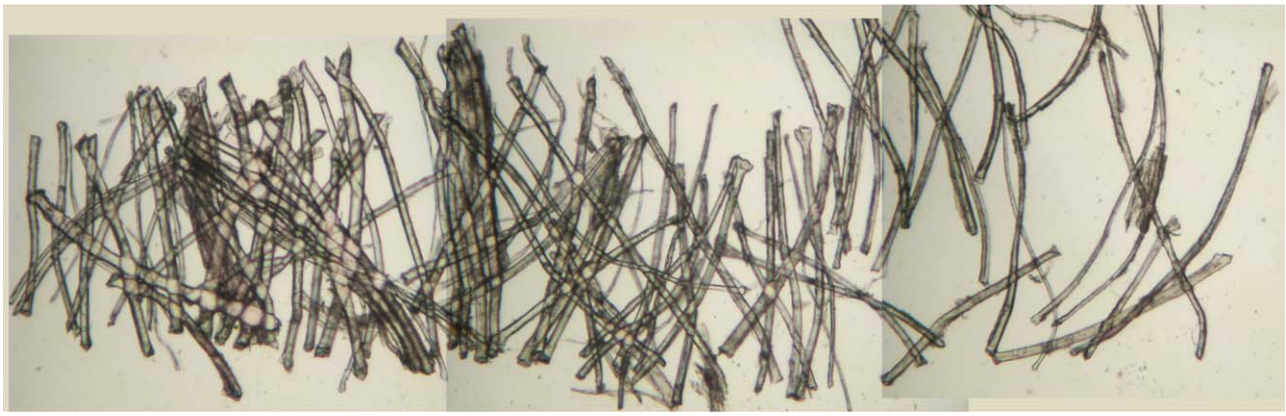

Figure F2. Fibers corresponding to a cross-section of one end of a weft TS thread coming from the 1988/C-14 area seen in transmitted light (mean fiber diameter of 0.015 mm) (© G. Fanti).

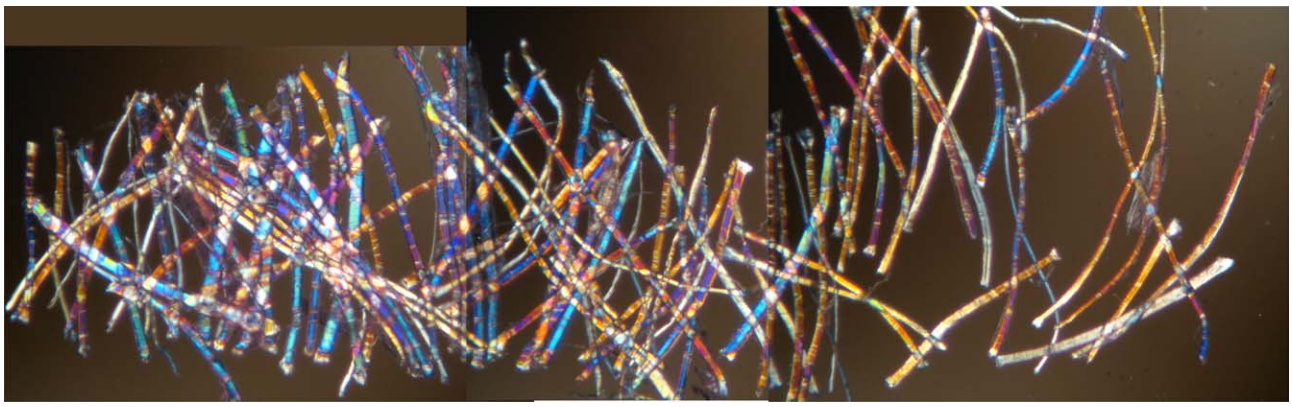

Figure F3. Fibers corresponding to a cross-section of one end of a weft TS thread coming from the 1988/C-14 area seen at extinction in cross-polarized light (© G. Fanti).

From Figures F2 and F3 it is not easy to detect the possible presence of cotton fibers also because it is possible the presence of some pieces of defective linen fiber that could be perhaps confused with a cotton fiber. In any case with higher magnification 4 cotton fibers were detected in F15001 TS thread, see Figure F4. They are parallel to the linen fibers and this fact leads to think that the cotton fibers were woven together with the linen fibers. The relatively small percentage of cotton fibers of (4/188=) 2.1% is in agreement with the hypothesis that cotton was a contaminant in the ambient where linen threads were prepared.

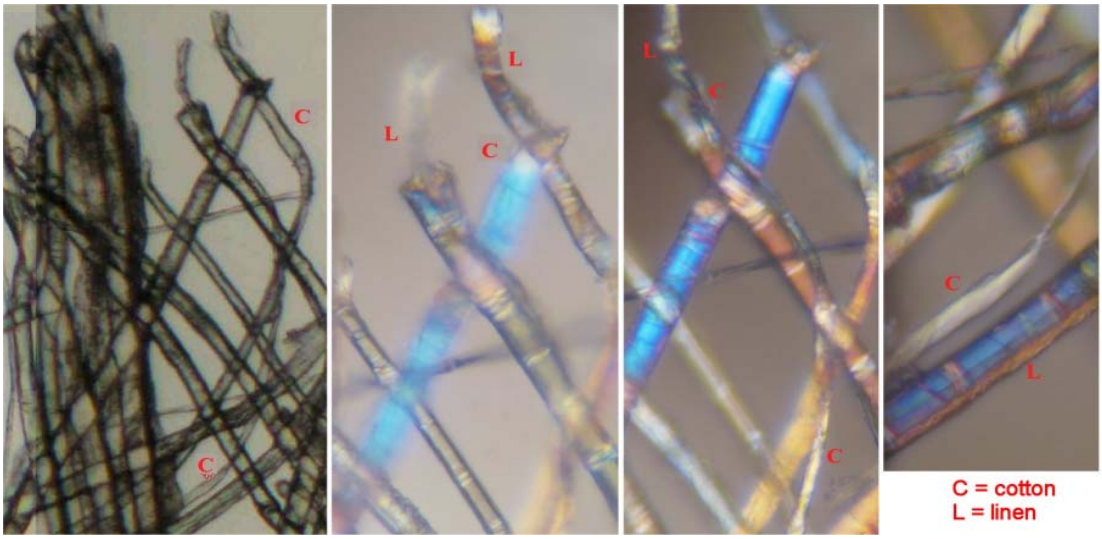

Figure F4: Cotton fibers ("C") detected in the cross-section of one end TS thread (© G. Fanti).

In synthesis cotton fibers are present in relatively small percentage in all the linen fibers sampled from the TS. While the presence of cotton fibers both detected in the dusts vacuumed from the TS and in the sticky tapes put in contact with the linen cloth during the STURP campaign can be easily connected with an external pollution due to the exposition of the linen fabric, the presence of cotton fibers (2.1% in fiber number) in a TS thread should be connected to an external pollution happened during the thread formation, before the fabric was built.

This last conclusion is also in agreement with the fact that the mean width of the cotton fibers detected in F15001 thread is at least two times smaller than that typical of 0.016 mm: this leads to think that the linen threads were woven in an ambient where also cotton threads were prepared and some fiber smaller than the normal were present in the ambient air.“