ROUND TABLE ON C-14:

DISCUSSION ABOUT A POSSIBLE NEW TEST ON THE SHROUD

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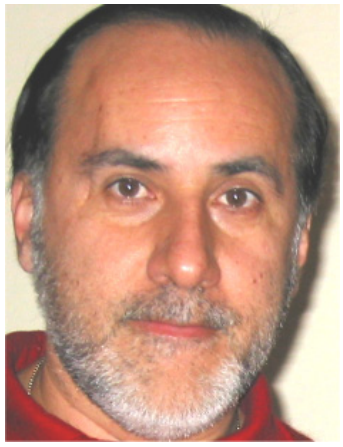

INTRODUCTION

The following questions need an answer before to accept the 1988 radiocarbon date.

-1) In the Nature report it is stated that "The results … yield a calibrated calendar age range with at least 95% confidence for the linen of the Shroud of Turin of AD 1260 – 1390...." How do you reach a 95% confidence level if the corresponding Chi-square value (reported in Table 2) is 6.4?

-2) R. Van Haelst and others corrected the errors written in the Nature report and obtained the following conclusion. The results of radiocarbon measurements of Arizona, Oxford and Zurigo labs yield a calibrated date of 1280-1300 BC with only a significance level of 1.2%. These results therefore furnish the conclusive evidence that the sample used by labs are NOT homogeneous in C-14 content. Is there any comment to this statement?

-3) The strip cut from the Shroud in 1988 was similar to a rectangle of ~21 mm x 81 mm, but only a part of it of ~17 mm x 41 mm was used for dating; why, from Nature report it results: "a strip (~10 mm x 70 mm) was cut"? Was perhaps dated a different sample by the labs or was it only a mistake?

-4) One of the fundamental hypotheses of the 14C method is: no contamination exists in the sample so all the 14C measured derives from the vegetable under consideration. The body image formation process is still not explained in the Turin Shroud image. How can anyone be sure that this fundamental hypothesis is verified in the present case and how can anyone demonstrate that there was no any change in the chemical structure of the linen fibers, also in terms of C-14, due to the image formation? (A. Adler, R. Rogers and others demonstrated that there was a chemical change in the image fibers).

-5) From Table 2 of Nature report, it results, for Sample #1, a mean radiocarbon date from Arizona lab of 646 ± 31years instead of 646 ± 17 years. Why this mistake was never corrected?
-6) The mistake in question (5) derives from a previous formula in which the right 17 value was used instead of the wrong 31. In addition, using 31 instead of 17 in the mean date from Arizona lab of 646 ± 31 years, resulted a significance level of 4.17% that was rounded to 5% to accomplish the predefined limit that allowed a combination of results. These data lead to think to a possible manipulation. Is there any comment to this statement?
-7) Using the corrected value of 17, a significance level of 1.2% results, very lower than the limit of 5%. Why the data were combined? Why the measurement were not repeated as it should have been done in this case?
-8) In Nature report, just before the Conclusions it is written: "The results, together with the statistical assessment of the data prepared in the British Museum, were forwarded to Professor Bray of the Istituto di Metrologia 'G. Colonetti', Turin, for his comments. He confirmed that the results of the three laboratories were mutually compatible, and that, on the evidence submitted, none of the mean results was questionable." Is there any agreement now to Bray's statement?
-9) Someone has observed that even if there is some mistake in the Nature report, all the results confirm a medieval age of the Turin Shroud. Is there any agreement now to this observation? If so, how the fact that the results are a clear clue of sample contamination can be coupled with this conclusion?
-10) Can it perhaps be excluded the hypothesis that a sign of contamination in very few square centimeters of fabric (corresponding to a difference of about 200 years) can lead to a contamination of the order of thousands years in some square meters in the same linen fabric?
-11) Why the initial proposed procedure, that foresaw the sampling in various locations of the Turin Shroud was not followed during the 1988 sampling? What was the information that allowed the scientist to surely suppose that the Shroud has a uniform content of C-14 in all its area, i.e. the linen cloth is homogeneous?
-12) According to B. Walsh and others, instead of a uniform model, at least a linear model, for the content of C-14 in the Turin Shroud area, should be assumed. Are they wrong?

If no clarifying answer will be obtained to these points a new radiocarbon dating of the Turin Shroud is necessary.

PROPOSAL

From the F. Barbesino & M. Moroni paper *("Neutron radiation effects on linen fibers and consequences for a radiocarbon dating", International Conference on the Shroud of Turin "Perspectives of a Multifaced Enigma", Columbus - Ohio August 14-17, 2008*), it experimentally results that the ^{14}C content increases with contamination.

A Lyma mummy sample (Apparent age or years BP = 2110) was artificially contaminated with neutron bombardment and then dated. It resulted that:

- after a soft pre-treatment (85% yield) the date was unreliable (apparent age or years BP = 590), with a **rejuvenation of 1520 years**.
- a very strong pre-treatment (10% yield) allowed to reach a more reliable dating (Apparent age or years BP = 1750) **with a rejuvenation of only 360 years**.

If also the **Turin Shroud** was in some way contaminated, as it preliminary results from the 1988 statistical results, it is probable that the 2000 years old cloth, dated to 1260 – 1390 (**rejuvenation of about 1300 years)** with a soft pre-treatment (about 80% yield, as declared in a non official way), could show a **rejuvenation of about 300 years** if a very strong pre-treatment (10% yield) will be applied to a linen sample of the Shroud.

The so called "Riserva" and another little piece of linen fabric adjacent to it are conserved for future studies. In agreement with B. Meacham, a Shroud sample should be treated in the next future in the following way:

-a) First pre-treatment yielding the 70%.
-b) From the 30% part of the TS sample chemically dissolved, carbon atoms must be recovered and dated in terms of ^{14}C ratio.
-c) Second pre-treatment yielding the 40%. The other dissolved 30% must be recovered and dated.
-d) Third pre-treatment yielding the 10%. The other dissolved 30% must be recovered and dated.
-e) The remaining 10% of the TS sample must be dated.
-f) A final comparison of the 4 dates must be done to evidence the probable contamination effects.

CONCLUSION

A new radiocarbon dating for the Turin Shroud is necessary perhaps also using the so called "Riserva" and the other little piece of linen fabric adjacent to it.

At this moment every suggestion for a more detailed test plan relative to a new ^{14}C dating of the Shroud is welcome.

Is it reliable to think to a 2009 shroud ^{14}C re-dating?