

**FROM MOSCOW'S DR. DMITRI KOUZNETSOV
- AN ANSWER TO THE CRITICISMS OF PROF. TITE**

Dr. Kouznetsov writes:

Thank you very much for your kind interest in our work, as presented in the form of a preliminary report at the recent Rome Symposium on the Shroud of Turin. I have emphasised the word 'preliminary' because of the overenthusiastic and less than professional attitude of some mass-media who reported this. In the light of such reactions we have decided to steer well clear of mass-circulation publications until we publish our complete report in one of the regular science journals.

However, since your Newsletter has published a scientific response to our work as given by Prof. Michael Tite [BSTS Newsletter no. 35, p.9], I would ask you to publish our brief answer to his criticisms. These seem to have arisen mainly due to misunderstandings of the relatively poor English style of the paper we distributed in Rome, and we would respond as follows:

I. We do not consider the C13/C12 normalization standard as used by Damon et al. ['Radiocarbon dating of the Shroud of Turin', *Nature*, 337, 1989, pp.611-615] to have been an assumption. We fully understand that the -25 (-27) ‰ value was experimentally measured in this work.

However, the conventional radiocarbon dating calculation model includes an assumption according to which at the 'time point zero', i.e. at the time when the linen was manufactured (ti=0), the C13 and C14 content values in the flax stems and the resultant textile were equal to each other.

In our view, this important point should be termed an 'assumption', and we already have sufficient grounds to declare it as incorrect. This is because of a known phenomenon of biological fractionation of carbon isotopes by living plants which leads, in respect of flax, to a significant relative enrichment of textiles by C14 and C13 during the manufacturing of the flax into linen.

Our argument is that this needs to be taken into account in order to make conventional radiocarbon dating calculations more accurate. And of course the adjustments involved must necessarily affect any radiocarbon date arrived at...

II. In the second part of Professor Tite's response, he claims that because the C13/C12 ratio values as measured by the laboratories for the 1988 testing were 'normal', i.e. equal to -25(-27) ‰ (conventionally normal, as we would say), there could have been no enrichment of the Shroud linen's C14 content.

In reply I would point out that if our fire-imitating model experiments have correctly indicated the probability of chromatography-like absorption of C13 and C14-containing combustion gas products by the linen textile template, then the above-mentioned 'normal' C13/C12 ratio may

well have been due to fire-induced contamination by exogenous carbon enriching an otherwise relatively low C13/C12 content to the Shroud as it existed before the 1532 fire.

In our view, this looks logical in the light of the well-recorded fact that in a number of modern manufactured linens, the range of variations in their C13/C12 index is very wide, from -46 ‰ up to -10 ‰, depending on such circumstances as the ecological conditions in which the flax was cultivated; the geographical/climate zone; the manufacturing technology involved (e.g. cellulose isolation/purification procedures); etc.

Additionally, large 24-37 year cyclic fluctuations have been observed in the C13/C12 and C14 content of some of the highest orders of plants, including Middle Eastern ones, during the last 800 years. These have shown up very clearly in mass-spectrometric analyses of different layers of the tree-rings from ancient, living trees.

This means that the possibility cannot be excluded of very low as well as very high levels of C14 and C13 in ancient Middle Eastern colonies of long-fibred flax. If so, the C13 and C14 content in the Shroud when first manufactured could have been significantly greater or less than the so-called 'normal' level as calculated from modern linen textile samples.

Thus the conventional statement about the equality of C13/C12 ratios in the linen of the Shroud as originally manufactured, and in any modern linen, must also be considered an assumption. And since this assumption seems to be incorrect, as argued above, suitable adjustments are needed for radiocarbon dating calculations. Understandably the development of a suitable procedure for such adjustment needs time and further research.

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[Editor's note: Dr. Kouznetsov has expressed his willingness to provide full references to accompany his arguments (some not in English), and at his request a copy of his letter was sent to Professor Tite at Oxford. Professor Tite has conveyed his thanks for this, but remarks that he and Dr. Robert Hedges 'feel that it is best to defer further comment until the definitive report is available.']