

C -14 AND THE SHROUD OF TURIN

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Science is normally done in the glare of peer review where other members of the scientific community study the planning and are able to offer insight into that planning. The C-14 procedure as performed on the Shroud was abnormal in the extreme. Meetings of C -14 people were in fact held, insights were offered, indeed a complete protocol was established. It was largely because two techniques, Accelerator Mass Spectrometry (AMS) and Small Proportional Counter (SPC), were to be used as cross-checks that the project for dating the Shroud gained wide acceptance among C -14 experts. BUT STRANGELY, THE TESTING WENT ON UNDER GREATEST SECRECY AND AGAINST EVERY BEST ADVICE FROM THE C-14 COMMUNITY. SPC WAS EXCLUDED. On January 27, 1988, Dr Harry Gove, INVENTOR of the AMS method which was used on the Shroud, wrote to the Director of the British Museum, which certified the results as a notary (but otherwise had no scientific involvement in the procedure), "I am astonished you would permit the British Museum to risk having its reputation called into question in what has become a SHODDY enterprise."

In brief, the Shroud was "dated" as follows: Three postage stamp-sized pieces were removed from an edge 2-3 cms from a seam sewn on at an unknown date, a site easily seen to be the most contaminated area of the Shroud since it was handled there to show the Shroud to the public numerous times over six centuries. Three labs used the same solvent to remove these impurities from the samples, though no determination was made of the specific nature of the contamination. The acceptability of the C-14 date derives from the fact that the three labs retrieved a tight group of dates; but this was inevitable from using the same area and the same solvent.

It is known that Shroud contamination includes oil, wax, tears, incense, and the smoke from a fire in 1532, when an abundance of carbon of that date thoroughly saturated the Shroud and water was poured onto it in its melting silver reliquary (900+ degrees) so as to explode into a super-heated vapour. This renders the Shroud unique in all the history of C-14 dating.

Also STRANGE is the supine acceptance of the date by the Vatican and its science advisor. For elementary textbooks of archaeology and geology as well as specialist papers universally warn against too great a reliance on C-14. Some opinions of the C-14 community:

"Removal of contaminants from pores, spaces and fissures is almost impossible".
(Stuckenrath, *Archaeology* 18.1965, 279)

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Excavated samples are "liable to absorb humic matter from the solutions that pass through them (causing) contamination by carbon compounds of an age younger than its own ... there is also possibility of exchange of carbon isotopes under such conditions ... and (that) other pitfalls are involved in this method is obvious enough". (Zeuner, *Dating the Past*, 1970, 341-6)

"Over the years we have learned that radiocarbon dating is not quite the alchemist's stone we once hoped it might be." (Wonnington, *Early Man in the New World*, 1983, 191)

*** "No historian would ... point to a radiocarbon date (or even a whole series of C-14 dates) and assert that this type of data provides ultimate proof of the reliability of a certain point of contention: (Barnard, *Radiocarbon Dates and their Significance in the Chinese Archaeological Scene*, 1980, 34)

*** "One or two dates should never be used by themselves to establish a site's chronology. So many dates have proven to be useless because of contamination and other causes that one can only establish a radiocarbon chronology with some degree of confidence if several dates from the same site fall into a consistent pattern that agrees with the stratigraphic sequence." (Betancourt et al, *Archaeometry* 20(2), 200-3)

"For C-14 the challenge of high precision has not yet been met, though each AMS conference shows progress." (Dr James Arnold, former colleague of Dr Willard Libby, 1947 Inventor of C-14 dating, *Nuclear Instruments and Methods in Physics Research*, B29, Nov 1987, 193-5) [NB: Arnold was referring to C-14 in geophysics, where the sample size is tens of grams; the Shroud samples were in milligrams.)

"Despite the euphoria ... directed for a decade at the AMS technique, it remains to prove fully its capabilities in terms of accuracy and affinity for small samples." (Scott et al, *Radiocarbon* 28.1, 1986, 167-9)

"At least 1 in 5 dates are (sic) contrary to expectation." (Batten et al, *Radiocarbon* 28.2A, 1986, 571-7, quoting Oxford University List #3. Oxford also reported that a major source of error in their dating procedure was in ... their methods of pretreatment of samples, i.e., in removing contamination. [Although Oxford had little experience in dating cloth, Oxford "dated" the Shroud,])

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"Before AMS is accepted as the final arbiter of chronology, criteria are needed to decide if and when the AMS date is unacceptable." (Dennell, "Review of Archaeological Results from Accelerator Dating ... By the Oxford Radiocarbon Accelerator", Oxford, 1987 in *Archaeometry* 61.231, March 1987, 137f.)

*** "One single date is no date." "For the particular case discussed here [i.e., Egyptian cloth] it is obvious that the number of 64 (sic) investigated samples is still too small to properly understand the observed disparity between the radiocarbon dates and historical chronology." (Wolfl, *Nuclear Instruments and Methods in Physics Research*, B29, 1987 1-13. Dr Wolfl is the University of Zurich C-14 expert who was 1000 years off in dating Egyptian linen but who "dated" the Shroud with a single 40 mg sample of the Shroud.)

COMMENT. The source of Wolfl's confidence in his Shroud date, as of Teddy Hall's of Oxford, must be counted as yet another of the mysteries of the Shroud.

"Every radiocarbon lab stresses the proper handling of excavated samples to avoid contamination additional to what may already have been deposited. The sample should be dried out immediately upon excavation to avoid mold growth, it should not be handled in a CLOUD OF CIGARETTE SMOKE or taken back from the field in a lunch box, it should not be placed in contact with a paper label ... contamination is a real danger for any C-14 material ... the Shroud has had a backing cloth for 450 years." (Meacham, "Radiocarbon Measurement and the Age of the Turin Shroud: Possibilities and Uncertainties," *Proceedings of Shroud Symposium*, Hong Kong, March, 1986)

Raaen (*Carbon-14*, 1968, 70) states that exchange reactions involving carbon atoms of the carboxyl group [one of the compounds produced by oxidation reactions in cellulose and present in quantity on the Shroud, indeed the very nature of the image] can occur with certain substances at temperatures of 300-400 degrees. [Recall the 960 degrees of the fire of 1532. The Shroud is thus an extremely unusual instance in which much later substances have been in contact with the sample at elevated temperatures; in this and in being handled for 600 years it is immensely different from objects retrieved from the ground of an archaeological dig which have been untouched for centuries.]

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To conclude, the general weaknesses of C-14 are significant. When one adds the specific additional and not-to-be-minimised complications provided by the Shroud's known history over 600 years there is ample reason to doubt the efficacy of the C-14 testing of the Shroud.



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