

## A new scenario for the dating of the Shroud

**The analysis of the raw data of the radiocarbon dating of 1988, obtained in 2017 by the British Museum, shows that something went wrong and it can no longer be said that the conclusions of that time are incontrovertible, indeed. A new dating is therefore necessary**

by [Emanuela Marinelli](#) on April 9, 2020 4:00 pm

**The radiocarbon dating of the Shroud, carried out in 1988, at the time seemed to leave no escape: the result, published in the journal 'Nature,' stated that the fabric is medieval (1260-1390 AD) and the test provided conclusive evidence. Despite the valid refutations of some scientists, this analysis has been considered by most of the academic world as the definitive proof of the falsity of the relic.**

**However, many shadows weighed on various aspects of the research carried out in 1989, the scientific committee of the international Shroud symposium held in Paris asked for the publication of all the raw data obtained by the three laboratories (Oxford, Tucson, Zurich) that had carried out tests. For many years this request has been ignored.** The statistical analysis which in 2013 questioned the validity of the article published in 'Nature' was based on the official data appearing in the journal.

Finally, in 2017 a French researcher, **Tristan Casabianca, was successful after legally requesting the raw data** (through the '*Freedom of Information Act*') from the British Museum, the institution in charge of statistical analysis, **managing to obtain the reports sent from the three workshops to the institution.** At this point **Casabianca involved the undersigned to identify the statisticians suitable for carrying out the evaluation of the precious material which had come into its possession.**

**So here comes Professor Benedetto Torrisi, Professor of Statistics at the University of Catania, and Dr. or Giuseppe Pernagallo, data analyst.**

**Together we have formed a very close team. We worked hard to achieve excellent results, which completely overturned the 1988 verdict.**

So here is what we were able to communicate at the end of our research.

**The main issue revolved around the raw data, the data used by the laboratories to obtain the dating published in 'Nature.'** Once we obtained these data, **we used several very powerful statistical tools to identify any problems** (analysis of variance, Ward and Wilson tests, parametric and non-parametric tests and a software promoted by Oxford currently used by analysts who deal with radiocarbon, the OxCal). **The results strongly suggest that laboratories have produced different results that cannot be**

**attributed to the same phenomenon. Probably, during the dating process something went wrong and the cause should be traced in the non-homogeneity of the selected samples.**

Our new statistical analysis, based on official data and raw data, shows that this conclusion is not reliable. **Our analysis shows that there is no definitive evidence that the Shroud of Turin is medieval.** These results of ours have been published in an Oxford magazine, *'Archeometry,'* 61, 5 (2019) 1223–1231, published on behalf of the *Oxford Research Laboratory for Archeology and the History of Art.* Our results are **further corroborated by the fact that the control samples did not show the same problems.** In addition to this, **the three laboratories mention the presence of important heterogeneous material not mentioned in the article on 'Nature,'** such as ancient cotton or blue and red threads .

The documentation released by the British Museum paints a much more complex picture than presented in the '*Nature*' article.

For example, we can now say with certainty that one of the laboratories - that of **Tucson** (Arizona) - **made eight measurements,** and that **these raw measurements show heterogeneity.** These heterogeneities are not mentioned in '*Nature.*' Based on these results, **it is not possible to continue to claim that the quantity of C14 atoms in the samples was constant, which represents a fundamental assumption for dating.** Eliminating the extreme values is therefore impossible, because this would result in a purely arbitrary decision.

Our findings highlight the fact that **the procedures** (selected after more than 10 years of negotiations between archaeologists, tissue experts and the Holy See) **have been far from perfect.** This point had already been highlighted by various researchers, including Harry E. Gove, the inventor of the AMS method, the unique and innovative method used to test the Shroud. Many were concerned that with only 3 labs, if something had gone wrong in one of them, it would have been impossible to know which one had produced reliable results. Furthermore, **there is no certainty that the protocol was strictly followed by all the laboratories.** For example, a sub-sample was not tested and therefore was not destroyed by the laboratory in Arizona.

In 1988, during a famous press conference, scientists revealed to the world that the dating age was in the years '1260-1390!' (with the exclamation mark). Our study makes it more than legitimate to change this exclamation mark into a question mark. **It can no longer be said that the conclusions of radiocarbon dating are, with 95% confidence, accurate and not even that they are representative of the whole cloth.**

From the results obtained in 1988 no one can say with certainty that the Shroud has medieval origins.

**A new dating is therefore necessary**, but it should be included in a true interdisciplinary process and, if possible, using non-destructive dating techniques. This procedure should be carefully thought out and applied by making a prior commitment to make the data freely available.

**Is it time for new tests on the Shroud? This is the question asked by journalist [Jane Stannus on the 'Catholic Herald' May 2, 2019](#)** after reading our article, which appeared in 'Archeometry'. The conclusions of the article, as already mentioned, are clear: the statistical analysis of the raw data of the radiocarbon analysis of 1988 shows that the samples were not homogeneous, therefore they could not be considered representative of the whole sheet. That test of C14, therefore, does not allow to say that the Shroud is medieval.

Stannus then decided to consult various radiocarbon analysis experts to hear their opinion on the matter. A certain fact emerges from his investigation: **almost everyone, denial or supporter** of the Shroud's authenticity, **agrees on the need for rigorously planned new tests**.

Today, for a reliable test, a few milligrams of material are sufficient, but to be taken at different points on the sheet. It should be remembered that the sample taken in 1988 came from a single corner, heavily polluted and mended.

Interesting what underlined by Dr. **Liam Kieser**, director of the laboratory for radiocarbon dating of the University of Ottawa: *"For a relic like the Shroud, decontamination of the sample is fundamental. It has been handled by many people over the centuries. The effect of hand sweat should be worried. It has also survived several fires: while the damage from smoking can be eliminated, the organic vapors associated with the fires can also be absorbed and incorporated permanently."* The examination of a fabric is extremely problematic from the point of view of contamination, because a fabric is entirely exposed to the environment in which it is found. An internal part can be sampled for a bone or piece of wood, but this is not possible in the case of a sheet.

An important laboratory for radiocarbon dating, the **Beta Analytic of Miami** (Florida), poses some conditions for the dating of tissues. One is very important: *"Beta Analytic does not perform cloth dating, unless this is part of a multidisciplinary research process."* This **necessary multidisciplinaryity was completely missing in the 1988 exam**.

Beta Analytic also underlines the **importance of pretreatment**: *"It is important to understand the pretreatments that will be applied to the samples, since these directly influence the result of the analyses."* And there is an important question to consider: "Can all fabrics be dated with precision?" Here is how they respond: *"Well-preserved*

*tissue samples with a good structure and not treated with preservative materials generate precise results. **Samples taken from a fabric treated with additives or preservatives generate a false radiocarbon age.** To ensure that the sample is datable, please email the laboratory with a description of the fabric or a high-resolution photo that allows a preliminary evaluation."*

The need for multidisciplinary it is underlined again by Beta Analytic shortly after, when it specifies: *"The laboratory does not perform the dating of fabrics or other objects of high or invaluable value, unless the payment and sending of the sample are carried out by a state body, by a museum or other recognized institution that is studying materials within a multidisciplinary research process. You can send the material through a professional archaeologist, who declares that the sample is suitable for radiocarbon dating."*

Therefore, **not all the finds are suitable for radiocarbon dating and the Shroud has all the characteristics to be one of the objects that do not provide reliable dating with this method.**

**But then, why redo a radiocarbon dating of the Shroud? To prove it once and for all.** The statistical analysis of a sample of a few centimeters was enough to demonstrate that its fragments were not homogeneous. Imagine what would emerge from the comparison of samples taken four meters away from each other. To deduce it, however, if new tests are not taken, common sense will suffice.

In the meantime, three new analyzes, conducted by the engineer **Giulio Fanti**, associate professor of mechanical and thermal measurements at the Industrial Engineering Department of the University of Padua, **date the Shroud to the time of Christ.** Some fibers of the relic have been subjected to two chemical dating, based on vibrational spectroscopy. Fanti explains in this regard: *"The basic idea is that time degrades the polymers of the fibers, modifying their chemical structure, so that the concentrations of certain groups of atoms, typical of cellulose, result to vary with the aging of the sample, groups that vibrational spectroscopy can recognize and count. After the correction of a systematic effect of 452 years, due to the Chambéry fire, the dating of the Shroud by means of FT-IR vibrational spectroscopic analysis - from English Fourier Transform to Infrared - was 300 BC  $\pm$  400 years at the level 95% confidence. The Raman vibrational analysis provided the dating of the Relic with the value of 200 BC  $\pm$  500 years, always at the 95% confidence level. **Both vibrational dates are compatible with the date of the first century AD in which Jesus of Nazareth lived in Palestine.**"*

The **third method of dating is mechanical**, the result of the work done by engineer **Pierandrea Malfi** for the achievement of the master's degree in mechanical engineering, under the supervision of Fanti. To carry out the experimental mechanical tests on flax fibers, a traction machine for vegetable textile fibers was specially designed

and built. Fanti clarifies: "The basic idea is in this case that the degradation of the polymer chains of the fibers promoted by time, going to break them and change the order in which they arrange each other in space, is able to modify their mechanical properties to the point of exploiting the property for dating purposes. In fact, it was found that five mechanical properties vary biunivocally (sic) with time. **The multiparametric mechanical dating** obtained on these five significant parameters, combined together, **led to an age of the Relic of 400 AD  $\pm$  400 years at the 95% confidence level.**"

This third date is also compatible with the date of the first century AD, reflecting the fact that the negative radiocarbon verdict of 1988 must be definitively shelved.