

<https://www.acistampa.com/story/la-sindone-e-il-grande-flop-della-datazione-medioevale-la-parola-agli-studiosi-11792>

Translated by Joe Marino

The Shroud and the great flop of medieval dating, the word to scholars

The Shroud Emanuela Marinelli takes us to know the truth

By *Angela Ambrogetti*

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That the Shroud is difficult to date and define is no secret to anyone.

But there was an examination in particular in 1988 that seemed to prevail over the others: the radiocarbon examination. Today, however, it is increasingly clear that this exam was wrong.

Acistampa spoke about it with Emanuela Marinelli, a sindonologist and author of many books on the various Shroud studies. In May in Catania, in a passionate conference, she presented the latest news on that date which today is considered incorrect.

Professor Marinelli, do you want to explain what the exam is and how it was carried out?

The test uses the existence in nature of small amounts of radioactive carbon, C-14, which combines with oxygen to form radioactive carbon dioxide. This is assimilated by the plants and ends accordingly in animals and men.

C-14 decays with time; the death of the living being ceases the assimilation of C-14 again and only decay continues. More time passes and less C-14 remains in the remains of the organism. By measuring the residual C-14 a radiocarbon age is attributed in proportion.

However, if the sample is contaminated by another C-14 of various origins, this also ends up in the count; the object is thus more radioactive and therefore, for dating purposes, "younger". Scientists are therefore very cautious in evaluating the results of the analyzes conducted with the C-14 method, because some contaminations cannot be eliminated with the normal sample cleaning methods. The scientific literature contains sensational cases of incorrect radiocarbon dating.

The analysis of the Shroud, carried out in 1988 with the radiocarbon method, had a wide resonance because the result placed the origin of the relic between 1260 and 1390 AD

The samples for the test were taken after years of discussions and contrasts between the bodies concerned and interested. In the end, three laboratories were chosen, those of the University of Tucson (Arizona), the University of Oxford and the Federal Institute of Technology in Zurich. All three used the new method of the Tandem accelerator, still little tested on fabrics.

The samples were taken on April 21st, 1988. The textile experts present agreed that the cut would take place in the left corner of the frontal image. The samples were delivered to the representatives of the laboratories, who were present. A long wait began which lasted for six months. In this period there were violations of the obligation of confidentiality and leaks, which caused a sensation in the English newspapers.

The agreements that were taken in January 1988 in London were completely disregarded. The laboratories not only did not complete the measures in the three months provided and did not maintain confidentiality but did not even send the data to the "Colonnetti" Institute in Turin for statistical analysis.

The representatives of the laboratories did not meet in Turin, as was expected, for the preparation of a scientific communication and to publicize the results to the Custodian, Cardinal Anastasio Ballestrero, who was informed by the physicist Michael Tite, director of the research laboratory of the British Museum and research coordinator, with a letter delivered by hand on 28 September.

The announcement of the result was made in Turin by Cardinal Ballestrero on the morning of October 13, 1988. On the afternoon of the same day Tite and representatives of the Oxford laboratory held a press conference in London. Behind them stood a blackboard, on which the date was written followed by an exclamation point.

What are the doubts on that exam?

Many scholars were against submitting the Shroud to the dating with the C-14 method, due to the peculiarity of the find, which has gone through a thousand vicissitudes and is contaminated by many substances. Mold, fungal hyphae, candle smoke, sweat, fire, water, contact with more recent fabrics, restorations, may have significantly altered the linen, compromising the validity of the radiocarbon examination. Furthermore, the angle from which the sample was taken was one of the most manipulated parts during the exhibitions.

The silver reliquary containing the Shroud was enveloped in flames in the fire of December 4, 1532 in Chambéry; the high temperature in a closed environment can provoke exchange of isotopes that lead to an enrichment of radioactive carbon, making the fabric proportionally "younger". The reaction is favored by the presence of silver.

Some bacteria operating on the surface of the linen can, through their enzymatic activity, chemically bind alkyl groups to cellulose. These groups contain carbon derived from the local environment. Even if bacteria are removed by cleaning, cellulose changes remain. It should be emphasized that the transformation of linen due to fire and microbial action is chemical and not physical: therefore, the solvents and cleaning techniques used by the radiological laboratories, which remove physical contamination, such as dirt, they do not remove the carbon-containing groups that have been added, because these groups form chemical bonds directly with the molecules of the cellulose itself.

Leoncio Garza Valdés, researcher at the Institute of Microbiology of the University of San Antonio (Texas), stated that he had identified on some threads of the Shroud the presence of a biological complex composed of fungi and bacteria that covers the threads like a patina and cannot be eliminated with normal cleaning treatments. **Therefore, it would have distorted the radiocarbon dating.**

Interesting analyzes, the results of which were published in the prestigious *Thermochimica Acta* journal in 2005, were conducted by the American chemist Raymond N. Rogers, who found encrustations of dyes and cotton fibrils in linen coming from the sampling area for analysis radiocarbon, an indication of an invisible mend **that has invalidated the validity of this test.**

Already in 1982, a thread of the Shroud from that area was dated with the radiocarbon method at the University of California. One half of the thread appeared to be covered with starch. The wire was divided in half: the non-starched part was dated 200 AD, while the starched part gave a date of 1000 AD.

She immediately pointed out that there were errors ...

The chronicle of the whole affair and the doubts of the scientific community were gathered in a book, the first to come out after the announcement of the results of the dating. I wrote that text with a great journalist, Orazio Petrosillo, the Vatican correspondent for *Il Messaggero*, who unfortunately passed away prematurely. **The volume, published by Rizzoli in 1990, had the prestigious preface by the writer Vittorio Messori**. It is now sold out, but an updated summary can be found online.

End of the first part.

Part two <https://www.acistampa.com/story/sindone-ecco-perche-la-datazione-e-da-rifare-11793>

Shroud, why the dating should be redone

Emanuela Marinelli explains in detail the admission of errors made by the laboratories themselves

By Angela Ambrogetti

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We continue our conversation with the Shroud Emanuela Marinelli who illustrates how we have arrived at the certainty that the dating with the radiocarbon method on the Shroud of 1988 is distorted.

A month ago in Catania a conference highlighted that everything has to be redone . What is the news?

The laboratories that dated the Shroud in 1988 with the radiocarbon method have produced different results, not attributable to the same phenomenon. **Their article was published in Nature on February 16, 1989**. The documentation released by the British Museum in 2017 to Dr. Tristan Casabianca paints a much more complex picture than the one presented in the article on *Nature*: for example, Arizona made eight measurements and these raw measurements show heterogeneity.

The statistical analysis of the raw data, performed by the working group coordinated by Prof. Benedetto Torrisi, Professor of Statistics at the University of Catania, with Dr. Giuseppe Pernagallo, Dr. Tristan Casabianca and the undersigned, published in *Archaeometry*, University of Oxford journal, March 22 this year (**Radiocarbon dating of the Shroud Turin: new evidence from raw data**), unequivocally confirms the inhomogeneity of the C-14 counts used for dating, probably due to a contaminant not removed by preliminary cleaning operations, a difficult problem to solve in the radio-dating of tissues, now well-known and not considered quite important in 1988, as confirmed also by Prof. Paolo Di Lazzaro, physicist at ENEA in Frascati. The analyzed sample, chosen from a single point that was very polluted and was mended due to its peculiar characteristics, did not represent the entire sheet. Torrisi and Pernagallo emphasized that the strong inhomogeneities between the three laboratories and within the laboratories are alarm bells that confirm the non-statistical representativeness of the fabric fragments used in the sampling.

Already in 2012, the statistical tests conducted by Prof. Marco Riani, a statistician at the University of Parma, on the data published by *Nature* revealed that the datings provided by the three different laboratories were significantly different.

The statistical tests confirm not only that already on the official data the doubts on the agreeability were more than legitimate, but reinforces this thesis, bringing strong evidence of non-homogeneity as regards the raw data as well as for the datings provided by the Arizona laboratory alone.

The conclusions were summarized as follows by prof. Torrisi:

We have no more doubts; the strong heterogeneity of the data leads us to affirm that the dating expressed on *Nature* is not the correct one.

The sample scheme does not provide a statistical representativeness of the sheet. The heterogeneity between the measurements provided by the different laboratories depends on where the pieces of fabric have been cut.

The raw data clearly show the inhomogeneity of the results between the three laboratories.

Several parametric and non-parametric tests show that data homogeneity problems remain both on data published in 1989 and on raw data.

In order to increase and deepen knowledge, it would be desirable to have a new multidisciplinary study campaign, which should aim to collect as much data as possible to form a complete map of the physical, chemical and biological characteristics of the entire Shroud, to be put available to scholars, so that they can work and discuss reliable and reliable data.

A new dating is therefore necessary.

"It amazes me," said Dr. Di Lazzaro, "as the expert in statistics of the British Museum who worked on the data did not realize that something was wrong." But perhaps there is a plausible explanation. "We must consider", continues Di Lazzaro, "that in 1988 the accelerator mass spectrometer technique was the newest technique, it was in its infancy. He was still learning how to use it. " Now faced with the choice of requesting another sample, admitting at that point that the technique had not succeeded in the intent and affirming the failure of the technique itself, obviously the simplest way was decided! Imagine what would have happened to admit that that technology was not suitable.

But now we need to look ahead, and Dr. Di Lazzaro launches a new possibility. Despite the radiocarbon analysis today, after thirty years, it has evolved, in order to preserve the integrity of the cloth, an alternative route could be attempted. From a chemical point of view the recent contaminant present in the cloth would be absent in that pile of carbonized fibers due to the Chambéry fire of 1532, taken in 2002 in different points of the cloth and kept at the Curia of Turin. Having been burned, they are "protected from possible pollution after 1532, and so their measurement could give very indicative information". So, you could start from there, trying to date those findings that come from all the burnt areas of the Shroud.

Part 3 <https://www.acistampa.com/story/la-sindone-il-vero-problema-e-limmagine-11801>

The Shroud, the real problem is the image

In addition to dating, the question is training and conservation, Emanuela Marinelli explains it

By Angela Ambrogetti

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After the recent revelations on the wrong dating and on how some studies have been distorted, today the most serious question for the Turin Shroud is how it should be preserved. Emanuela Marinelli explains the future prospects and other ongoing studies to Acistampa.

How is the Shroud kept today?

In 2000 Alenia Spazio, now Thales Alenia Space Italia, created a case for the conservation of the precious linen; it was made from a single block of aluminum, suitably constructed to avoid welding. The sheet - which is kept stretched out in the dark, in the absence of air and in the presence of an inert gas, the argon - is protected by watertight bullet-proof glass and is maintained in constant weather conditions through various monitoring systems.

Why is the radiocarbon test not essential? There are many other tests that deny it

Three new analyzes, conducted in 2013 by the engineer Giulio Fanti, associate professor of mechanical and thermal measurements at the Department of Industrial Engineering of the University of Padua, date the Shroud to the age of Christ. Some relic fibers have undergone 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, vary with the aging of the sample, groups that vibrational spectroscopy is able to recognize and count.

After the correction of a systematic effect of 452 years, due to the Chambéry fire, the dating of the Shroud by FT-IR vibrational spectroscopic analysis - from English Fourier Transform to Infrared - was found in 300 BC. \pm 400 years at the 95% confidence level.

The Raman vibrational analysis has provided the value of the Relic of 200 BC \pm 500 years, always at the 95% confidence level. Both vibrational datings are compatible with the date of the 1st century AD in which Jesus of Nazareth lived in Palestine ».

The third dating method is mechanical, the result of the work done by the engineer Pierandrea Malfi for the achievement of the master's degree in Mechanical Engineering, under the supervision of Fanti. To conduct the experimental mechanical tests on linen fibers, a traction machine for vegetable textile fibers was specially designed and built. Fanti explains: «The basic idea in this case is that the degradation of the polymer chains of the fibers promoted by time, by breaking them and changing the order in which they mutually arrange themselves in space, is able to modify their mechanical properties to the point of exploiting the property for dating purposes. Indeed, it turned out that five mechanical properties vary uniquely 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 ». He then concludes: "The average of the values resulting from the two chemical and mechanical datings gives the most probable date of the Shroud of 33 BC. \pm 250 years at the 95% confidence level ".

In addition to these new tests, there are other details that testify in favor of the antiquity of the Shroud. For example, the Swiss textile expert Mechthild FluryLemberg pointed out that the side strip joined to the Shroud, made of the same fabric, has a particular seam structure, for which there are

comparisons with fragments of fabric from the archaeological finds of Masada. The excavations conducted in this area have brought to light a large quantity of fabric fragments, which in the 1990s were examined in detail. The research therefore provides valuable information on fabric structures and their processing for garments during the period between 40 BC. and the fall of Masada, which occurred in 74 AD.

In the findings of fabrics in Masada there is also the special typology of the structure of the selvedge that exists on the Shroud on the long external sides. Since on the short sides of the cloth there are instead the edges, the Shroud must have been cut by a longer cloth roll. The fabric and workmanship of the funeral sheet leaves no doubt about its professional production. This cloth was neither woven in a domestic frame, nor sewn by an unqualified hand: it is a linen of great value. It could be an expensive import commodity.

The Shroud therefore has characteristics similar to those of Jewish fabrics from the time of Christ.

Another important topic that testifies to the existence of the relic already in the first centuries is the striking resemblance to the ancient depictions of the Face of Jesus, which certainly appear to have been copied from the Shroud Face.

The most important study today is about image and its conservation Is it disappearing?

The image on the Shroud is still a mystery. It is inexplicable how a corpse could have left the photographic image of itself on the sheet. In the area of the impression only the superficial film of the outer fibrils is yellowed, therefore the image can only be seen from the side of the sheet that was towards the body; on the wrong side of the fabric is not present. On the back you can see blood stains, which have passed from side to side.

The translucent yellow color of the image area is not due to any substance placed on the wires: the wires themselves have darkened.

The yellowing is caused by a degradation of the external surface of the fibrils, which is oxidized and dehydrated. It is a yellowing identical to that which light causes on the cellulose of wood, paper and fabrics over the years; except that in this case the phenomenon at the origin of the impression has darkened the fibrils to the maximum, while the rest of the sheet has the normal ivory color due to the passage of time.

The only explanation consistent with all the characteristics of the Shroud image would be to admit that the imprint was formed due to the exposure of the sheet to a brief but intense source of energy, coming from the inside of the human body covered by the Shroud. But it is a solution to the problem that goes beyond science. Only those who believe in the resurrection of Christ can admit that at that time a unique and unrepeatable phenomenon occurred, an emission of energy that left its mark on the fabric.

The experiment that has most succeeded in approaching the characteristics of the Shroud image has been realized in recent years in Frascati (Rome) by a group of physicists from ENEA, the National Agency for New Technologies, Energy and the sustainable economic development.

Some linen fabrics have been irradiated with an excimer laser, which emits high intensity ultraviolet radiation. The results, compared with the Shroud image, show interesting analogies: the coloring is similar and is limited to the superficial part of the fabric. The possibility is confirmed that the Shroud image was caused by directional ultraviolet radiation.

In the future the yellowing of the sheet will increase and reach the maximum degree of darkening, which has already been reached by the fibrils of the impression; at that point there will be no difference with the background and therefore the image will no longer be visible. For this reason the Shroud is preserved in the dark and is exposed as little as possible.

What the scientific community should do today

The scientific community should promote a new multidisciplinary plan of studies that includes the problem of conservation, that of dating and that of the origin of the image along with advanced studies on DNA and micro-traces on the cloth. The Shroud is a fascinating mystery for all, believers and non-believers; we cannot stop studying it and admire it.