

The origin of Rogers' Raes and C14 samples

By Thibault Heimburger, MD.

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Warning: this is the text of the paper I presented at the Saint-Louis Conference (October 2014). My PowerPoint presentation will be published at the same time as a PDF. When you read Slide 1, Slide 2 etc. in this document, you have to look at this PDF to see the photographs, documents etc. which are cited in the present paper.

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INTRODUCTION

In 2005, Rogers published in the peer-reviewed journal *Thermochimica Acta* (TCA) which is his famous and last paper titled, "Studies on the radiocarbon sample from the shroud of Turin"¹. This article was Rogers' final result of several years of researches and experiments.

Rogers concluded: *"the combined evidence from chemical kinetics, analytical chemistry, cotton content and pyrolysis mass spectroscopy proves that the material from the radiocarbon area of the shroud is significantly different from that of the main cloth. The radiocarbon sample was thus not part of the original cloth and is invalid for determining the age of the shroud"*.

At the time, Rogers' conclusion resonated in the scientific community of Sindologists since it was the first scientifically acceptable explanation of the amazing radiocarbon dating.

In the following months, several criticisms were published.

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One kind of criticisms or doubts concerned the samples Rogers had. Rogers' TCA paper is based on the comparison between the 1978 STURP sticky-tape samples, some threads coming from the 1973 Raes sample and other threads from the 1988 radiocarbon area. For some people the authenticity of the Raes and radiocarbon samples is questionable.

This is an important preliminary problem that must be solved, because if Rogers had used dubious samples, his claims would be meaningless.

¹ *Thermochimica Acta* 425 (2005) 189–194. Available at : <http://www.shroud.it/ROGERS-3.PDF>

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In this presentation, thanks to unpublished documents, I will try to answer to the question of the authenticity of the Raes and C14 samples of Rogers.

- Are the Rogers' Raes samples genuine Shroud samples?
- How was it possible for Rogers to obtain samples from the « center of the radiocarbon area »? What does it mean?
- Is there a chain of custody for those samples?

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THE DOCUMENTS

The documents I have are:

1) First, the Luigi Gonella Collection (LGC):

Professor Luigi Gonella was the scientific advisor of cardinal Ballestero from 1978 until 1989. As such, he was at the center of all of the modern scientific studies.

Gonella died on 8/8/2007. His paper archives kept by his family were then given to Franco Faia who took photographs of all of them.

Giovanni Gonella, son of Luigi Gonella, gave Barrie Schwartz a compact disc containing all of the photographs. In 2010, I met Barrie, Giovanni Gonella and Franco Faia in Turin during the 2010 Shroud exhibition.

There, Barrie Schwartz gave me a copy of this disc with the agreement of Giovanni Gonella.

2) Second, the Rogers collection:

The Rogers collection consists of several doc files and photographs found in Rogers' computer after Rogers' death by Barrie Schwartz. Those files concern both the Raes and C14 samples of Rogers.

3) Third, the archives of the Holy Shroud Guild² also contain some interesting documents that I have been kindly allowed to use in this presentation by Giorgio Bracaglia.

SUMMARY OF ROGERS' FINDINGS

To conclude that the Raes/C14 area is not representative of the whole cloth, Rogers rests on three main arguments:

² <http://holyshroudguild.org/index.html>

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1) There are much more cotton fibers mixed with flax fibers in this area than in the Shroud which is almost pure linen.

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2) The entire Raes/C14 corner is covered with a unique alizarin/gum dye. This dye is not found elsewhere on the Shroud. This assertion is based on both microchemistry and pyrolysis mass spectrometry.

Rogers wrote: *"The color and distribution of the coating implies that repairs were made at an unknown time with foreign linen dyed to match the older original material"*.

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3) The phloroglucinol-HCl (Wiesner) color test is widely used to detect lignin which is a minor component of linen. Heller and Adler found that the test was negative on all of the 1978 sticky-tapes samples coming from many different parts of the Shroud.

Rogers performed the same test on the Raes samples he had and found that the fibers gave a clear positive test³.

The Holland backing cloth and some other medieval fabrics gave the test, while ancient linen from Dead Sea scrolls did not.

The degradation of lignin with time is very slow and Rogers could give a suitable chemical-age predictive model. From the disappearance of vanillin (the target of the test in lignin⁴) in all parts of the Shroud, he concluded that the Shroud might be between 1300 and 3000 years old, depending on the storage conditions.

The 1532 fire could not explain the disappearance of the vanillin in all parts of the Shroud but the Raes corner. Natural ageing and degradation of the lignin is the best explanation of this difference.

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HISTORY OF THE RAES SAMPLES

11/23/1973: a small sectional triangular sample was taken from a corner of the Shroud and given to Prof. Gilbert Raes, a renowned textile expert.

In February 1974, Raes sent his report to Turin.

According to Raes, his sample was made of two parts which he cut and studied separately:

- Part 1 coming from the main part of the Shroud. In this part he found "traces of cotton" from the herbaceum species in both warp and weft linen threads.

³ Unfortunately, up to now, no photograph of this test has been found in the Rogers' collection.

⁴ From modern studies we now know that vanillin is likely not the target of the test in the complex lignin structure. This fact does not change Rogers' reasoning.

- Part 2 coming from the rest of a tiny remnant of the side strip. He did not find cotton in this part but only flax fibers.
- And the linen sewing thread joining the two parts.

Between 1973 and 1976, we know that the sample was simply kept by Raes in his house without particular precaution.

In 1976, David Sox and McCrone met Raes and asked for his sample in order to perform a radiocarbon dating of the sample. Raes refused and asked Turin what he had to do with his sample. Gonella answered he had to send it back to Turin immediately. Raes sent back his sample at the end of October 1976.

The poor and unsafe storage conditions of the sample in Raes home were the starting point of the suspicion of Turin about the Raes sample they received in 1976.

Gonella wrote (LGC-1⁵): *"... then he [Raes] held them for years on his desk where they were seen and handled by several people. (...)"*

The Raes samples as received by Gonella were the separated Part 1 and 2 but without any indication of which sample was Part 1 and which Part 2 (LGC-1).

Gonella added (LGC-1): *"The sample has thus lost all documentary value, and can not be used anymore for formal examinations"*.

In Turin, the Raes samples were then kept in safe.

In 1979, Rogers asked Gonella to bring the Raes samples in Los Alamos where an important STURP meeting had been scheduled. Rogers wished to do some non destructive experiments.

Gonella agreed and asked the Cardinal for the samples. Unfortunately, according to Gonella⁶, some people in Turin did not want to share anything with the American STURP team.

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In a letter dated 10/11/1979 from Rinaldi (HSG archives), one read: *"I had a lunch with Gonella (...). And there is where the cardinal was truly magnificent. He directed Mons Caramello to give Gonella several threads from the two samples available since the exposition in 1973"* (The Raes samples). We don't know who exactly extracted the threads.

In any case we have many proofs from Gonella's collection that on 10/14/1979, Gonella himself gave 14 Raes threads to Rogers in Los Alamos in the presence of many STURP members.

In this photograph, we see the 14 Raes threads "as received" still in the plastic bag (Rogers Collection). Rogers numbered the threads, took photographs of each of them and placed them in safe.

⁵ LGC. Cronistoria della ricerca scientifica sulla S.Sindone, p.1, note 4

⁶ From a private hand-written letter found in the LGC, not shown here.

From the Rogers collection, we know that during the following years some threads were destroyed in experiments or sent to other researchers.

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The Rogers collection shows that most if not all of his experiments (dye and cotton) were made on Raes # 1, 5 and 14.

As a good scientist, Rogers wanted to confirm his findings. Therefore:

- He sent Raes#1 (a splice) to a team of the Los Alamos National Laboratory (LANL) in February 2005. After the death of Rogers, the LANL team also received Raes# 7 and 14 from Barrie Schwartz. The results of the LANL studies were presented at the Columbus Shroud conference in 2008.
- He sent Raes#7 and 14 to John Brown who was an expert in microscopy and who published his results in 2005.
- In 2008, at the Columbus Shroud Conference, Barrie Schwartz gave me Raes#7 and I published my observations

All of these independent studies performed on Raes#1, 5, 7 and 14 confirmed what Rogers found about the high cotton content and the dye found in the Raes sample.

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AUTHENTICITY OF THE RAES SAMPLES

We have seen that Luigi Gonella had some doubts about the Raes samples he received from Raes at the end of October 1976.

The reason of Gonella's suspicion is clearly explained in a document of Sister Damian of the Cross (Nitowski) who met Luigi Gonella on 4/28/1986.

She writes⁷: *"Dr. Gonella then said that he had reason to believe that some or all of the Raes samples had been switched with materials not originally from the Shroud. He explained that a relative of Gilbert Raes had been overhead to say, "We all have pieces of the Shroud now" ..."*

On 10/29/1982, Rogers had sent to Kohlbeck a part of Raes#5 and several sticky-tape Mylar samples from 1978 in order to perform high-quality microphotographs on those samples. Quickly, Kohlbeck decided to work with Nitowski who was an archaeologist.

At the time of the meeting with Gonella in 1986, Nitowski had the samples given to Kohlbeck by Rogers. At Gonella's request, she looked at Raes#5 to check the thread's twist, since an "S" twist *"would quite clearly indicate that a switch had occurred"*.

She writes: *"On the evening of August 25, 1986, I looked at the Raes sample through the microscope for the first time (...). The thread showed a "Z" twist through the microscope-then it dawned on me*

⁷ HSG archives. Criteria for Authentication: "A procedure for the Verification of Shroud samples" by Sister Damian of the Cross, OCD. November 9, 1986. <http://holyshroudguild.org/dr-nitowski-new.html>

that I must take into account that any image in the microscope is reversed. The thread in actuality has an "S" twist". She added "A heavy coating on the fibers of the thread even made the identification of those fibers as flax difficult. I had never noticed this on any of the Mylar tapes and felt quite certain that this thread had not come from the Shroud".

She also added: *"I fully believe that Dr. Rogers is completely innocent in this matter (...)"*.

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Unfortunately, Nitowski was wrong about the twist of Raes#5.

A "Z" twist is the mirror image of a "S" twist and vice-versa.

What you see through the microscope is the reversed image, not the mirror image.

"Z" remains "Z" through the microscope and "S" remains "S".

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The "Z" twist of Raes#5 through the microscope indicate that in actuality the thread has a "Z" twist and not a "S" twist as she wrote.

By the way, a close-up of Rogers photographs show a "Z" twisted Raes#5 thread.

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Regarding the authenticity of the Raes samples and threads given to Rogers, we are only left with a rumor.

Even if some people in Raes' close circle took some threads or fibers as suggested by Gonella, it does not imply necessarily that a switch occurred. Even in this case the goal of a switch of some threads or parts of the samples would have been both unnecessary and very difficult to do.

The facts:

We do know that in 1976 Gonella received from Raes two samples and not only lose threads.

We do know that in Turin the samples were kept in Mons. Caramello's safe⁸.

We do know that the samples did match geometrically the 1973 cutting, since Gonella wrote⁹ about the Raes sample: *"I do not mean it has been replaced (at the occasion of the 1988 sampling, it has been verified that it did match the cut in the fabric)..."*.

It is now clear that a substitution of the samples themselves is inconceivable.

A switch of some threads, those threads given to Rogers, would also be nonsense. Who? When and for what purpose?

⁸ LGC. Gonella's letter to cardinal, dated September 15, 1979. Ref.: 790915 Gonella_card

⁹ LGC. Cronistoria della ricerca scientifica sulla S.Sindone. P.1, note 4.

To the contrary, Rogers's photographs show clearly the characteristic indentations of threads excised from the 3:1 weave of the Shroud.

And later, Rogers could verify that the anomalous cotton content as well as the dye were also found in his radiocarbon samples, taken many years later in another context.

There is nothing but rumors against the authenticity of the Rogers' Raes threads.

There are many observed facts consistent with those threads being authentic shroud threads.

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PRESENTATION OF ROGERS'S RADIOCARBON SAMPLES

All of the following photographs and sentences were found in the Rogers collection.

The radiocarbon samples as received by Rogers were:

1) First, as described by Rogers: *"A solid piece of plastic that contained segments of linen fibers. This is probably a casting that was made so that fibers could be sectioned perpendicular to their axes. I suspect this was made by Adler"*.

2) A weft thread, about 4 mm. in length.

3) A warp thread about 15 mm. in length.

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The weft and warp pieces of threads were the radiocarbon samples in which Rogers found the same dye and cotton content he previously found in some of his Raes threads.

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RADIOCARBON ROGERS' SAMPLES: THE CHAIN OF CUSTODY

The source of the following data is a "confidential letter from Tom D'Muhala to Barrie Schwartz", dated April 7, 2014.

- In December 1988, 8 months after the radiocarbon sampling, Gonella sent a package containing threads from the April 1988 radiocarbon samples to Alan Adler who received them in January 1989. It was on Gonella's initiative that those samples were sent to Adler at Adler's request.

- From January 1989 until June 2000, the samples were in the custody of Adler who published in 1998 a paper entitled "Further spectroscopic investigations of samples of the Shroud of Turin"¹⁰. In this

¹⁰ Alan Adler, Russel Selzer and Frank DeBlase: "Further Spectroscopic investigations of samples of the Shroud of Turin". First published in Proceedings of the 1998 Dallas Shroud Symposium, M. Minor ed., Dallas 2000.

paper he wrote: *“The administrators of the radiodate sampling, L. Gonella and G.Riggi, kindly provided three threads from the radiocarbon sample for our study”*.

- In June 2000, Adler sent a small portion of his thread samples with a hand written note to Steve Mattingly (University of Texas Health Science Center, San Antonio, Texas).

- In November 2001, Mattingly sent back the package and wrote that he even did not look at the samples. The package contained the Adler’s envelope, note and shroud and flax samples. The samples were in three vials labeled “Warp”, “Weft” and “Flax”.

- In November 2003, Ray Rogers asked if he could borrow the samples for use in his work.

- In December 2003, Larry Schwalbe received and signed the registered mail receipt and Chain of Custody Documents and then hand-delivered the samples to Rogers who acknowledged receipt of the samples the next day.

- In January 2004, Rogers called and asked where exactly the “radiocarbon samples” sent in 1988 to Adler came from. Gonella himself answered *“from the center of the radiocarbon sample”*.

The chain of custody has been carefully maintained. All of the packaging, envelopes and documents are still in safe.

The C14 samples studied by Rogers were truly a part of the samples sent to Adler by Gonella himself in December 1988 and, according to Gonella, those samples came from the “center of the radiocarbon sample”.

However the question remains: what does “from the center of the radiocarbon sample” mean?

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ORIGIN OF THE ROGERS’ RADIOCARBON SAMPLES

We know that all of the remaining samples from the April 1988 sampling were kept by Riggi and Gonella with the non-written but undisputable authorization of cardinal Ballestrero. This is also true for the reserve sample since Gonella wrote in paper¹¹: *“the reserve sample was entrusted by the Custodian to Gonella and Riggi ...”*

There is no formal document about the threads taken from the center of the radiocarbon area, but the following LGC document throws new lights on this question

From “the Orphaned Manuscript” A Shroud Spectrum Special Issue, D. Crispino, Effata ed., 2002.

¹¹ LGC. Cronistoria della ricerca scientifica sulla S.Sindone, p.33.

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This document is not dated (but obviously written during or after the radiocarbon sampling), nor signed but the writing is that of Gonella.

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Translation:

- Sample 1: two long warp threads from the trimmed band close to the radiocarbon sample.
- Sample 2: one warp thread from the border of the back side of the reserve sample.
- Sample 3: Three weft threads from the edge near the sample [given to] the laboratories.

Looking at the drawing, it is clear that samples 2 and 3 came from the Reserve sample.

To summarize:

We know that some threads of the radiocarbon area were sent to Adler in December 1988 by Gonella himself and then that some of them were given to Rogers in December 2003.

We know that Gonella himself attested that the samples sent to Adler came from “the center of the radiocarbon sample”.

The only possible conclusion is that the Rogers’ C14 samples are true weft and warp threads coming from the samples **adjacent** to the samples given to the laboratories for dating.

Rogers’ warp thread came either from the trimmed band (sample 1) or from the reserve (sample 2). Rogers’ weft thread came from the reserve (sample 3).

This document thus explains why Gonella could say that the samples given to Rogers came from the center of the radiocarbon sample, if one considers the Reserve as part of the radiocarbon sample.

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CONCLUSION:

We have shown that the samples used by Rogers showing that the Raes/C14 area is not representative of the whole cloth were **authentic Shroud samples**.

- There is no serious reason to doubt the authenticity of the Raes samples sent back to Turin in 1976 by G. Raes. There are many reasons to support the authenticity of those samples. The Raes threads given to Rogers by Gonella were threads excised from those samples on the order of Card. Ballestrero himself.

- The two warp and weft Rogers radiocarbon threads are genuine threads from the Reserve (or perhaps from the trimmed band for the warp). They were first sent by Gonella to Adler in 1988. Gonella had kept them in safe with the authorization of Card. Ballestrero. A number of

letters and documents found in the LGC demonstrate that. The remaining 1988 samples, including the Reserve, were therefore under the custody of Riggi and Gonella. These samples could be used for possible further scientific studies or in case of contestation. This is exactly what happened. Gonella sent some of them to Adler in 1988. Much later, some of them were then given to Rogers and the chain of custody is clear. Moreover, it is now possible to understand why the Rogers' samples came from "the center of the radiocarbon sample" as Gonella said.

Although one can discuss the signification of each of Rogers' findings, those findings themselves are significant and taken together they make sense. The C14 dated area has important properties that are different from those of the main part of the shroud.

The only mean to know with certainty the true age of the Turin Shroud is to perform a new radiocarbon dating in a multidisciplinary approach.

This dating must be performed on samples coming from at least 3 different areas and after close examination including microscopy, modern chemistry and modern micro-spectroscopy.

Acknowledgements: See **SLIDE 23**