

UNWRAPPING THE SHROUD: NEW EVIDENCE A Review
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The Shroud of Turin is a controversial topic. There have been many documentaries aired on the shroud, but few if any have risen to the coherence and intellectual integrity of *Unwrapping the Shroud: New Evidence* which was aired on December 14, 2008 at 10 p.m. Eastern Standard Time on the Discovery Channel. It was re-aired on December 20th with some minor corrections.

I've been personally interested in the shroud for many years, almost half a century, and in that time I've seen many shroud documentaries and have quite a few of them in the form of video cassettes and DVDs. Shroud documentaries tend to be of two kinds which I will caricature as "catfights" and "groupie-fests". The first kind lines up proponents of authenticity and proponents of inauthenticity and creates a pseudo-confrontation since the two sides rarely directly engage the arguments. Then at the end the narrator will look out at the audience and say something like: "You've heard the evidence, now you must decide." The conflict in these "catfights" is artificial because there is no direct engagement of the two sides.

"Groupie-fests" are worse. These are documentaries that take a point of view and cherry-pick the data to present their side, usually ignoring any opposing data. They come in two basic forms, the breathless awe of a shroud image created by a flash of radiation at the Resurrection, or a contemptuous treatment that ridicules the shroud as a clumsy fake, usually by advancing a technique which comes laughably short of duplicating the actual shroud image.

Now I said *caricature* advisedly since most of the documentaries are not quite as bad as I've suggested. But they do tend to fall into the two kinds I've lampooned.

What makes *UNWRAPPING THE SHROUD: NEW EVIDENCE* different is that it tells a real story with a real mystery at its heart, a story with real people exploring the mystery and directly engaging it intellectually. Shroud of Turin documentaries like that are rare.

The documentary begins with a flash back to 1978 and the Shroud of Turin Research Project (STURP), a team of about twenty-four scientists who gained an unprecedented 120 hours, five days, to study the shroud with a wide variety of advanced scientific instrumentation. The question was basically: What was it? Among the many men of science on the STURP team was Ray Rogers, a distinguished chemist from Los Alamos National Laboratory and Barrie Schwartz, team documenting photographer who acts as the voice of STURP on the documentary.

To introduce how STURP came to be in Turin that fateful Fall of 1978, the documentary quickly sketches the history of the photography starting with Secondo Pia in 1898 and

Giuseppe Enrie in 1931. Pia's photography had showed that the shroud image acted like a photographic negative and revealed a remarkable image. He was derided at the time and accused of fraud as Barrie Schwartz describes in his narration. Then in 1931 Enrie's much more technically successful photographs vindicated Pia.

The next imaging discovery was made in 1976 when a VP-8 image analyzer confirmed the three-dimensional character of the shroud image using the Enrie photographs. Pete Schumacher, a VP-8 engineer and technician demonstrates the technology and the startling result that opened the way for the STURP team to go to Turin.

The documentary goes on to explore the STURP research, demonstrating briefly one of the most startling results of the STURP teams work, the fact that the blood stains were surrounded by serum rings that fluoresced. That fact and the blood chemistry work of the STURP team convincingly demonstrated that the blood on the shroud was real blood. When STURP was finished they had shown that the shroud was not a painting, the image was three dimensional in character and the blood was real blood but the mystery of how the image got on the cloth remained and remains today.

The known history of the shroud makes its authenticity questionable since it only appears in European history at Lirey, France in the 1350's. The documentary rather quickly sketches the travels of the shroud to arrive in Turin in 1578 where it resides to this day. STURP had shown the shroud was not a painting but what was it then?

Dr. Fred Zugibe was the next stop in the investigation. A forensic pathologist and the Chief Medical Examiner of Rockland County, New York for over thirty years, Dr. Zugibe had made a careful study of crucifixion beginning when he was still a medical student in 1948. Dr. Zugibe briefly reviewed the pathology of crucifixion as revealed on the shroud concluding that the shroud accurately portrays the pathology of crucifixion.

The next stop was to establish how old the shroud was using the proven methods of Carbon 14 dating. The documentary interviewed Dr. Timothy Jull, Professor of Geosciences at the University of Arizona, and Director of the NSF-Arizona AMS Facility who described Carbon 14 dating using Atomic Mass Spectroscopy which literally counts the atoms in the sample and determines the ratio of C14 to C12. Applying norms, the age of the sample can be calculated. Alex Leonard, a Senior Research Specialist, and Dr. Dana Biddulph, an Experimental Physicist at the Arizona AMS facility demonstrated aspects of the sample preparation and analysis process.

In 1988 three AMS labs, one at Arizona, at Oxford and at Zurich analyzed portions cut from a single strip of cloth taken from one corner of the shroud. They dated it and concluded that the shroud was medieval, dating from between 1260 and 1390 C.E. On this finding the shroud could not be authentic. This settled it for Ray Rogers who accepted the finding. But it was far from settled in the minds of many.

Dr. Joseph Accetta, a principal research scientist at the Georgia Tech Research Institute (GTRI), and one of the original STURP members from 1978 made several appearances in

the documentary and here commented on the fact that many of those committed to the authenticity of the shroud would not accept the Carbon 14 finding and sought reasons to dismiss the result. Many of these reasons were highly speculative or just plain wrong and this infuriated Ray Rogers, who Barrie Schwartz characterized as a "gun-fighter" ready to shoot down bad science in a moment.

Two non-scientists enter the story at this point, Joe Marino and Sue Benford who in about 2000 advanced the theory that the shroud sample divided among the carbon labs had been the site of a 16th century invisible reweaving that cut diagonally across the sample and this explained the bad carbon result. In the documentary they show the sub-samples dated by the AMS labs and show they exhibit a systematic progression of dates.

For Ray Rogers this was the last straw. He set out to show that the Benford-Marino theory was wrong. He was stunned to find it confirmed when he examined samples he had from the same region as the carbon sample. They contained cotton that had been dyed as if to match the surrounding shroud material. He found dyes and cotton in reserve fibers from the carbon sample region.

But Ray Rogers was in a race with death. He was suffering from incurable cancer. His last scientific paper in the peer-reviewed journal *Thermochimica Acta* [1] reported on his findings. The carbon dating was valid, but the sample appeared not to be representative of the shroud. In the documentary, Ray Rogers describes his work and his own surprise at his findings. Accetta comments that you have to use cotton if you want to make a patch because you have to match the color and linen doesn't dye well. But Ray Rogers lost his battle with cancer only five weeks after his paper was published. If his work is to continue it must be in the hands of others.

Bob Villarreal another Los Alamos chemist and friend of Ray Rogers, was asked by Ray to carry on the work. Bob describes in the documentary a sample actually breaking apart separating into two pieces that had been held together by a mordant.

The documentary concludes with Ray Rogers' concerns about future carbon dating due to the fumigation of the shroud's reliquary with thymol thereby contaminating the shroud with contemporary carbon and the suggestion that the charred linen remaining from the 1532 fire which had been removed in 2002 might be the only valid samples left with which to recheck the carbon date.

As the credits roll we see and hear Barrie Schwartz pointing out that if the shroud is not authentic that would still leave the unanswered question: "How was it done?"

This is a documentary that belongs in the collection of everyone interested in the Shroud of Turin. It is an insightful, informed, and cogent account of the best current theory for why the 1988 date is simply wrong. It is also a mystery and an adventure story told by the adventurers themselves. It captures one man's struggle to be true to his principles and to learn the truth. In short it is perhaps the best documentary on the shroud that has been made.

1. Raymond N. Rogers, "Studies on the radiocarbon sample from the Shroud of Turin," *Thermochimica Acta* 425 (Jan. 20, 2005): 189-194

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