

Clues tell much, but not all, about shroud

By Linda Holderness
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As scientists unravel the mysteries of the Holy Shroud of Turin, the big question still persists: Is the shroud the burial cloth of Jesus?

The answer, says Dr. Eric Jumper, who has researched the cloth since 1975, may never be known.

The shroud, a long strip of hand-woven linen measuring about 14 by 3½ feet, bears a faint image of the front and back of a man with the wounds of crucifixion. The image shows apparent blood stains about the head, wrists, feet and left side and evidence of beatings with a whip.

Since the 14th century, the cloth has been exhibited as the burial shroud of Jesus Christ. For 450 years it has been housed in the Chapel of the Holy Shroud in the northern Italian city of Turin.

Scientists will never be able to prove the shroud is authentic, Jumper told an audience at St. John's New Parish Hall in Folsom last month. The best they can do is determine that the shroud probably held the body of a crucified man about 2,000 years ago. They can never prove that body was Jesus Christ.

"I don't know anybody who's come up with a test for Jesus," Jumper said.

Jumper, an Air Force engineer with a laser physics background, was a leader of a team of 30 scientists who traveled to Turin, Italy, for five days in 1978 to conduct intensive tests of the cloth.

The son of a Folsom native, Jumper, 37, talked about the study and the shroud during a visit to his parents' home near Folsom Lake. At the time of the study, he was an instructor at the Air Force Academy in Colorado. He now teaches and does research at the Air Force Institute of Technology in Ohio.

Despite the Air Force connection — another leader of the team was also an Air Force officer — the study was not a military project. The group was independently financed by donations, grants and personal funds. It was made up of Christians, Jews and even agnostics.

"The free time that some people use for hobbies, I use to work on the shroud," Jumper said. Money comes from donations, grants and personal funds.

Though a practicing Catholic, Jumper approaches the shroud purely as a scientist. But it may have been religion that prompted his interest.

"I started off accepting that the shroud was authentic," he said. But too many questions remain unresolved.

Jumper said he now realizes the shroud is not an essential part of Christian doctrine.

"I don't think the shroud plays any role in my religious life whatsoever," he said. "It doesn't matter if it's real or unreal."

Jumper speaks quietly and methodically about the team's intricate detective work. The scientists, he said, performed hundreds of non-destructive tests on the cloth, using chemistry, computers, X-rays and photography.

Though results do not indicate the shroud is a fraud — and in some cases have disproved claims of fakery — the study is still inconclusive, Jumper said. The most important test — carbon-



Eric Jumper

dating the fabric — has not been performed.

At the time of the study, Jumper said, carbon-dating the shroud would have consumed too much material. But new methods allow accurate dating to within 200 years using only a few snippets of fabric. The team has requested permission from the Archbishop of Turin to conduct the tests and will return to Italy if the go-ahead is granted.

But even if tests show the cloth to be

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2,000 years old, Jumper said, they can't prove the image is the same age. And the image cannot be dated.

Dating the fabric is important because there is no record of the shroud's existence before the Middle Ages. It was first known in France in 1350.

In 1473, the Duke of Savoy (the royal house of Italy) gained possession of the shroud, and in 1578 it was moved by a descendant of the duke to Turin. After the death last year of Italy's former King Umberto, ownership of the shroud passed to the Vatican. The cloth has remained in Turin, under the custody of the archbishop.

The skimpy history, Jumper said, is a "very bad point against the shroud. You can't trace it back to Jesus."

The 1350 date is significant, too. At that time, Jumper said, "everybody was producing relics. It's certainly possible that the history of the shroud does end in the Middle Ages."

The style of the cloth gives no clue to its age. The herringbone weave was at first thought not to have existed in biblical times. Later the team learned it was occasionally used then but was more common several centuries later.

Geographically, though, the weave is correct.

"The pattern," Jumper said, "was not introduced into Europe before 1400. Since the shroud was known in Europe the century before, the cloth had to have come from the Middle East."

The scientists have found one clue that the shroud may have existed

before the 14th century. The cloth contains several small patches sewn on by nuns in 1534 after a fire damaged the material. Tests showed the shroud material is probably a great deal older than the patches.

Despite the interest in the cloth itself, it is the shroud's markings that have most baffled observers through the centuries. The body image, faint yellow lines only on the surface of the linen threads, resemble scorch marks. Darker spots looking like bloodstains are visible about the head, wrists, feet and left side. Critics as early as 1389 were making claims the markings had been painted on.

Jumper's team proved two positive points: The image is definitely not a painting, and it is anatomically correct.

Chemical tests of particles picked up with sticky tape revealed no paint pigment anywhere on the shroud, Jumper said, and the faint yellow color of the body image did not saturate the fibers of the cloth as paint would have done.

The bloodstains, he said, are exactly that — blood.

The stains had penetrated the material and showed a pattern following the natural direction of blood flow from the wounds. And each stain was surrounded by a lighter ring of serum characteristic of bloodstains.

Microscopic examination proved the substance was blood, Jumper said.

Though the bloodstains are accurate, the origin of the body image on the cloth is less certain, even after testing.

In the Turin study, Jumper's team found the image was not formed from any substance added to the cloth.

"Under the microscope," Jumper said, "the shroud doesn't appear to be coated with anything. The image is just due to the fact that the linen fibrils have discolored."

In the case of the markings, he said, the natural process of aging has been accelerated and the image fibers have darkened faster than the fibers surrounding them. As the cloth continues to age, he said, the color will eventually even out and the image will disappear.

Many factors could cause heightened discoloration, but none alone could give the clear image and impression of dimension present on the shroud, Jumper said.

He theorizes the discoloration was caused by a combination of processes, including contact with body oils and diffusion of vapors from the body to the shroud.

Though the scientists can never prove the shroud held the body of Jesus, they have determined that the image could be that of a crucified man.

The Turin team performed one practical test. They wrapped volunteers in lengths of material similar to the shroud. The markings they recorded showed the exact amount of visual distortion present in the shroud's image.

If the man in the shroud is Christ, they learned something new about him. He would have been about 5 feet 10 inches tall. That height is within the normal range for men of biblical times, Jumper said.

The location of the markings is also significant. The bloodstains, Jumper said, correspond exactly to wounds Christ received. Although most artists depict Jesus as having been crucified

with nails through his hands, the nails actually were driven through the wrists, as shown on the shroud.

The stains also show small rivulets of blood about the head, possibly from a crown of thorns of the type the Bible said Jesus was made to wear.

Other bloodstains on the body appear to be the result of beatings with a type of Roman whip common during Christ's time, Jumper said.

"It's so horrifying," he said, "to see the number of blows on the body. The body is far more beaten up than you ever see in a crucifix."

One of the most interesting finds, Jumper said, was common dirt par-

ticles about the image's heels.

"Quite frankly," he said, "I was surprised. But what could be more logical?"

Though he continues to dig for clues to the shroud's past, Jumper, who remains devoutly religious, searches only as a scientist. Even if tests prove the shroud cannot be 2,000 years old, it would still be an important Christian relic, he said.

"It has images that clearly represent the images of Jesus after the crucifixion," he said. "Whether it's a fraud or it's authentic doesn't change the idea that the images on there represent Jesus. Like any image of anything that's religious, it has certain religious overtones."