

The Shroud of Turin bears the photographically negative image of a man about six feet tall. It appears that the man was placed on one end of the 14-foot strip, with the other

end folded over him. The scorch markings that flank the body were created in 1532, when a fire melted the silver box in which the shroud was being stored.

## Mystery of Turin shroud continues to fascinate scientists

By Karen M. Franz

"This year could be a media event," says Father George Rosenkranz, CSSR, the Our Lady of Victory priest who — during the Holy Weeks of the last four years — has presented area shoppers with a display on the Shroud of Turin.

Father Rosenkranz expects his display to attract heightened attention this year because it will include information on a much publicized process one University of Rochester scientist hopes to use to determine the shroud's age.

The shroud, a strip of linen cloth measuring 14 feet long by 3 feet wide, bears the image of a crucified man. Father Rosenkranz, who has studied the shroud since 1978, explains that the image — which resembles a photographic negative — is of a Jewish male about 30; the head, wrists, feet and side are marked by wounds, the back shows scourge marks, and the face is bruised. The blood on the shroud has been identified as being human, he notes. All in all, the image corresponds almost perfectly with

gospel accounts of Jesus' Passion and death.

Moreover, "it's a perfect image of the human body," he says, remarking that only 100 years ago, doctors lacked the anatomical knowledge that would have been required to create such an accurate and detailed image.

Yet, Father Rosenkranz notes somewhat sarcastically, "There remains a one-in-a-trillion chance that there could have been another Jew to which this all happened." And, he says, even if scientists were to positively determine that the cloth is 2,000 years old, "Skeptics can still say the image happened later."

Historically, the Shroud of Turin can be traced back no further than the year 1357, although legends of such a burial garment circulated many centuries earlier. In 1453, the House of Savoy, an Italian ruling family, gained possession of the sacred cloth and brought it to Turin. It has remained in Turin since that time, although its ownership was transferred to the Vatican in 1983, upon the death of deposed King Umberto II.

Extreme devotion to and scientific fascination with the shroud have at times spawned misinformation and wild rumors. In December of 1979, the Courier-Journal carried a Religious News Service article headlined, "The Shroud: Scientists Find It's Authentic," concerning a 1978 marathon testing session in which scientists merely failed to find any evidence that the shroud

was not the burial cloth of Christ.

Only six months ago, following a workshop in which researchers outlined their proposed methodology for carbon dating the cloth, the cardinal archbishop of Turin announced to news media that six laboratories — including UR — had received the go-ahead from Rome to begin tests almost immediately.

According to Dr. Harry Gove, the UR nuclear physicist who would be conducting the local tests, such statements have been premature and overly optimistic. After more than 10 years of proposals and of waiting, Dr. Gove has not yet received any word — positive or negative — from the Vatican.

"I ascribe and have ascribed for many years the slowness of movement to the newness of the (UR's carbon-dating) technique," Dr. Gove explained, referring to a method he and two other scientists developed in 1977. Yet, he adds, "the time for that excuse is now long past."

"I don't lust to test the shroud ... I think there are some questions that science can answer, and some that might better remain unanswered. I'd just like them to say, one way or another," he lamented.

Scientists' ability to date organic materials stems from their understanding of radioactive materials and their properties. Carbon-14 is a radioactive isotope produced in the earth's atmosphere by cosmic rays. In respiration, all living organisms — both plants and animals — take in small amounts of carbon dioxide which contains fixed proportions of carbon-14 and the more common and non-radioactive isotope, carbon-12 (one part carbon-14 to about 1 trillion parts ordinary carbon-12).

When an organism dies, it no longer takes in carbon dioxide, and the carbon-14 within its remains decays at a fixed rate, known as a half-life. About 6,000 years after the organism's death, the remains will contain one-

half the amount of carbon-14 the organism contained while living.

By extracting the carbon from a sample of organic material — which is accomplished by burning the sample — and computing the ratio of carbon-14 to carbon-12, scientists can determine the number of half-lives that have occurred, and hence, how long the organism has been dead. By measuring the carbon-14 content of the shroud, scientists would determine when the flax plants from which it was made were harvested.


Dr. Gove's involvement with the shroud began more than 10 years ago, when he presented a research paper on a new means of measuring the carbon-14 content of organic materials. Previous methods had involved measuring the rate of carbon-14 decay — which is related to radioactive content and half-life. This process is time-consuming and requires a large sample of material, sometimes as much as a quarter-pound.

Dr. Gove's method, however, uses a nuclear-particle accelerator to actually count the number of carbon-14 atoms in an organic sample. It requires the destruction of only 1/1,000th the amount of material used in the conventional process, and is more accurate.

When word of the new procedure spread, the secretary of the British Turin Shroud Society contacted Dr. Gove regarding the feasibility of testing it. As a result, Dr. Gove participated in a 1978 five-day marathon testing session conducted in Turin at the conclusion of a six-week public exhibition that marked the 400th anniversary of the shroud's arrival in that city. The meeting had been organized by Professor Carlos Chagas, head of the Pontifical Academy of Sciences in Rome.


Dr. Gove said that a seventh laboratory recently joined the ranks of those interested

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