

Shroud of Scientific Questions

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COVER: Max Delbrück, an inspirational leader in the field of molecular genetics, died last month. In this photograph, taken at the California Institute of Technology in 1949, Delbrück is perched in front of the window and Gunther Stent is to his right. See p. 268. (Photograph provided by Cold Spring Harbor Laboratory)

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In the early fourth century the Lady Helena, mother of the Emperor Constantine, engaged in a series of archaeological digs in Jerusalem, during which she unearthed the True Cross. She was a shrewd old woman. She had started her career tending bar in a soldiers' tavern in Nish, a place where the naive were unlikely to last long. Whatever convinced her of the authenticity of the wood she found must have been strong — unless her religious devotion, which was also strong, got in the way of her critical faculties.

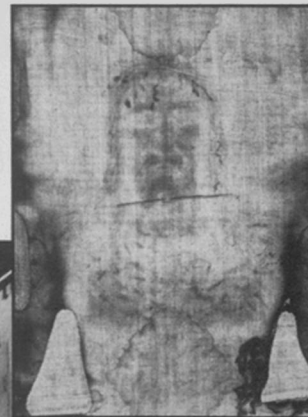
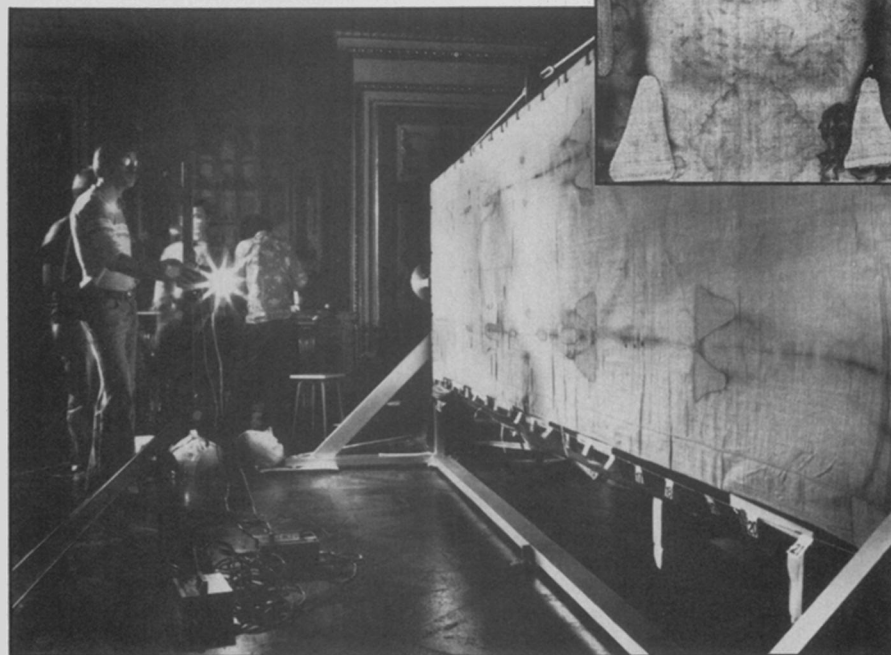
The Shroud of Turin would be a relic to rank almost with the True Cross, if it is truly what many believe it to be — the burial shroud of Jesus. It is a piece of linen about 14 feet by 4 feet, on which is somehow printed the ventral and dorsal images of the body of a man who bears the wounds ascribed in the gospels to Jesus just before and during his crucifixion.

St. Helena did not have a group of interested scientists who were eager to examine her wood by every possible test. The Shroud of Turin does—the Shroud of Turin Research Project, Inc. They work in their spare time, using privately donated funds. The shroud seems to be a fascination to various people in chemistry, physics, aerodynamics, serology, physiology and forensics. There have been reports that all these people were close to some consensus about the shroud. There have also been reports of basic disagreement among them. Talking to several of them and reading recent publications of others, SCIENCE NEWS has found that there is lively dis-

agreement among them. Sometimes the disagreement becomes quite sharp. Allegations of consensus seem premature.

Yet there is progress in sorting out various hypotheses about the shroud. It might be best to begin with a statement by Vernon Miller, chairman of the Industrial and Scientific Department of Brooks Institute School of Photographic Art and Science in Santa Barbara, Calif., who says, "The 14 ft strip of cloth does bear the image of a man who evidently was crucified in a manner described in the scriptures for the crucifixion of Jesus of Nazareth. Whether it is the burial cloth of Christ is not a fact that science can categorically prove." For 600 years detractors have said the image was a painting or else a scorch made by draping the cloth over a hot statue.

The Brooks Institute, which did the special photography necessary for the current scientific efforts at examining the shroud, is now showing an exhibition of shroud photographs. Elsewhere in the releases put out for the exhibit is the statement: "This had led to scientists believing that the unique three-dimensional quality of the shroud image proves beyond doubt that the linen cloth must have been



Face of image (r). How the shroud was hung for observation in 1978 (below).

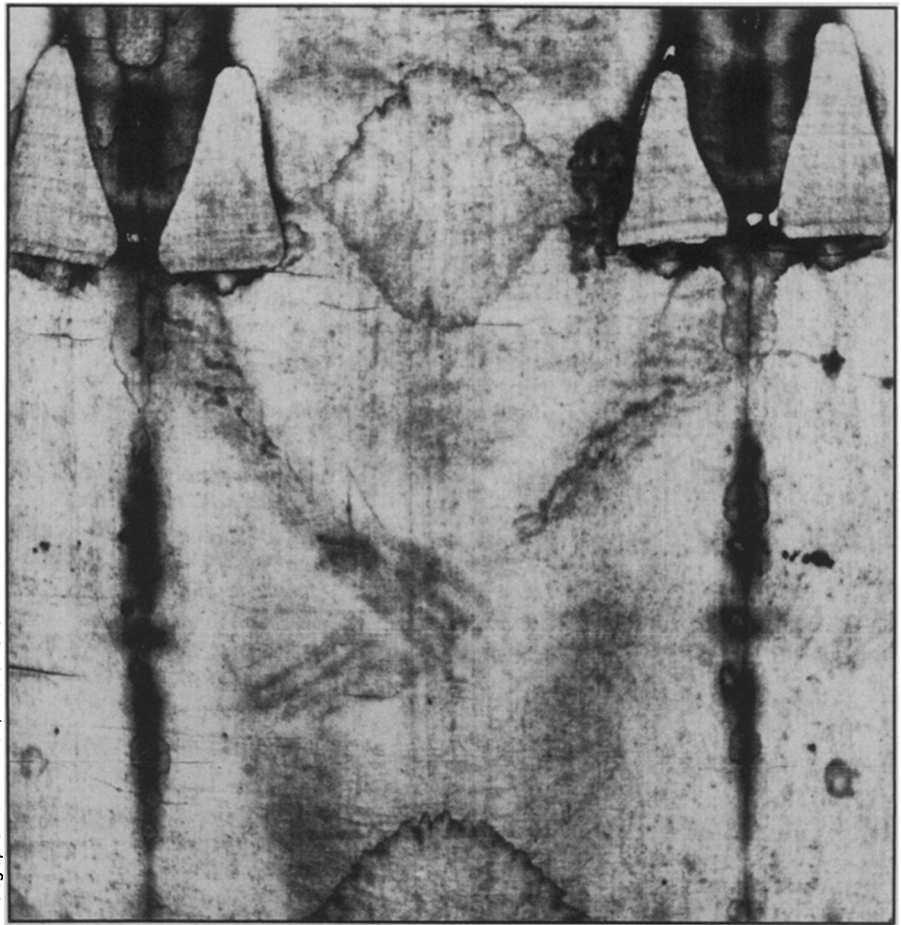
Photographs: Vernon Miller ©, Brooks Institute

wrapped around a human corpse whose volume contours were encoded in the varying intensity levels of the image."

The word "this" in the last quote refers to the work of John Jackson and Eric Jumper, done at the U.S. Air Force Academy in Colorado Springs, Colo. They noticed that the variations in density in the shroud image seemed to correspond to what would be the distance of portions of a three-dimensional body from a cloth folded over it. Employing a number of live male volunteers, they gathered the statistics to support their hypothesis and made a statue of a man from the three-dimensional information contained in the shroud image. Jumper told SCIENCE NEWS that they have lately refined their data to account for draping of the cloth so that the three-dimensional image is more lifelike.

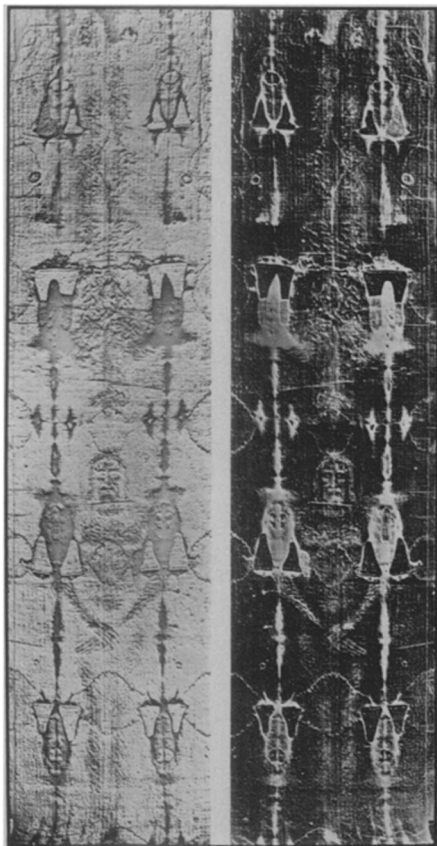
Jumper is willing to say that the shroud is "probably genuine in that it wrapped a dead body. I can't say it was Jesus. I don't want to touch the question." He cautions, furthermore, that such a conclusion cannot be drawn from his and Jackson's work alone. "It's a synergistic problem," he says. The work of different people has to be put together, and no one is quite willing to put his name on something that he has not done himself in order to draw a conclusion from it.

Jackson's and Jumper's work alone can at most relate the shroud to the figure of a man, which might be stone or metal, the famous hot statue. Jumper cites the work of Robert Bucklin, a forensic pathologist and assistant coroner for Los Angeles



Photographs: Vernon Miller, Brooks Institute

Digitized photo shows crossed hands. Right wrist bears apparent nail wound.



The full image, positive and negative.

county, which might be added to give weight to the proposition of a dead body. Bucklin told SCIENCE NEWS that his examination of the wound images and apparent blood flows on the shroud indicates that they accord with what the gospels record of the wounds of Jesus and they appear as a knowledgeable anatomist might expect them to. He will say that the figure apparently received 40 lashes on front and back with a flagellum characteristic of those used by the ancient Romans. The crown of thorns seems to have been more like a cap. There is a wound in the left side that pierced the heart with "a large outflow of blood consistent with a lance placed in the side." To say that a statue was involved with these things carved in it means that the "statue would have been done before much was known about the anatomy of circulation." Bucklin feels very strongly that it was a cloth wrapped over a body, and is waiting for carbon 14 dating, which it appears the archbishop of Turin is now ready to permit, to tell when the linen was woven. If the date should prove right, he says, "add all likelihoods together and there's one chance in 50 million it's not what we think it is."

Far less positive is Raymond Rogers of Los Alamos National Laboratory. He has been working with Los Alamos colleague Larry Schwalbe to compile a summary report of the researches done on the shroud, particularly the spectroscopic ones and

the chemistry of things picked off the surface with sticky tape. The shroud project started with three hypotheses, he says: that the image was a painting, that it was a scorch and that it was a natural product. Basically, he says, they seem to have shown that it was not a painting or a scorch, but they don't know really what it is. The image does not penetrate the fibers the way paint does, it lies on the uppermost fibrils of the threads. The chemistry is wrong for a scorch. There is a suggestion by Samuel F. Pellicori of the Santa Barbara Research Center that the image was made by accelerated aging of the cloth catalyzed by skin secretions that touched the appropriate parts. Rogers points out that such catalysts would have to come as liquids or gases and so diffuse or soak into the threads. Whatever made this image didn't do so. Nevertheless, he says, "we are working with Sam, seeking some kind of compromise." Of Jackson's and Jumper's work, he says that it proves the image was made in a self-consistent way, but not that a 3-D model was involved, though he acknowledges that they insist that there was.

The whole question seems still very much up in the air. Rogers complains about the red herrings the scientists continually have to get rid of. "If I'd known of the red herrings, I might not have started," he says. Maybe St. Helena had an advantage. □