

¶ Is this the actual burial cloth of Christ?

## *The Problem of the Holy Shroud*

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IN A MAGNIFICENT chapel adjoining the cathedral at Turin, Italy, is enshrined a linen cloth which has been venerated for centuries as the actual shroud of Christ. Upon its 14-foot length are two remarkably clear impressions representing the front and back of a human body. The belief is that these were made by Christ's body, which was laid on half the cloth, the other half being folded over from head to foot as a cover.

For years many scholars, Catholic as well as non-Catholic, maintained that the figures on the Holy Shroud are paintings, dating from the 14<sup>th</sup> century. But since 1931, two Commissions—one Italian, the other French—have scientifically investigated the authenticity of the relic. Their findings give strong evidence that the figures on the Shroud are not paintings; that they are impressions of a human body, made by a unique coincidence of natural causes; and that the body was Christ's.

When the Shroud was photographed for the first time it was discovered that the lights and shades of these images are reversed as in a photographic negative—the parts which normally appear dark in life or in a picture, such as the eye sockets or space between the outstretched legs, are light on the Shroud. When the values of light and shade are again reversed by photography, the face stands out in startling majesty.

The idea of a negative image became known only through the invention of photography in the 19<sup>th</sup> century. It is doubtful if any artist of an earlier period could have conceived of the idea of painting a negative image. The figures, moreover, are very exact negatives that no artist even today could paint so accurately. When

photographed they show on the film a full-grown man, portrayed with minute fidelity to nature.

After experiments in the laboratory of the Sorbonne, the French Commission concluded that the figures are the direct imprints of a human body, made by natural chemical causes: the vapors given off by the body reacting chemically on the cloth to produce stains. The action was strongest where the body was very close to the cloth, less strong at the concavities and sides. That is why the resulting stains are negatives, the high spots of the body having caused a darker stain than the cavities and depressions; that is why the impressions have such delicate shading.

With the aid of a professor of physics at the École Polytechnique, I was able to determine what kind of vapors had acted on the cloth: humid ammoniac vapors resulting from the fermentation of urea, which is exceptionally abundant in the sweat produced by physical torture. Knowing that the ancients spread powdered aloes on shrouds as a preservative, we discovered that the aloes chemically sensitized linen cloth to the action of ammonia vapors, thus producing a brown stain. In fact, I obtained imprints like those on the Shroud by placing cloths prepared with aloes over plaster figures soaked in a solution of ammonia.

It was also established that there are particles of blood on the Shroud, so well preserved that they still show the composition of the blood.

The body which made the impressions on the Shroud was evidently that of a man who had been crucified; all the wounds are clearly distinguishable. The wound in the hand is the most interesting: contrary to the usual pictures, which show the nail through the palm of a crucified hand, the nail wound is where the anatomy of the hand would require in a crucifixion—through the base of the wrist. The man on the Shroud had been scourged and also wounded about the head, as show by trickles of blood and several distinct punctures on the brow, which a crown of thorns would explain. There is

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\*Translated from the French by Edward A. Wuenschel. The editors of *Scientific American* made investigations of sources of information about the Holy Shroud sufficient, in their opinion, to justify publication of this article. They refrain, however, from taking sides on the question of its authenticity.

a wound in the right side, such as would be caused by a lance. And the wounds of a great nail, which pierced both feet at once. From the Gospels we know all this was done to Christ as the result of exceptional circumstances, and it is hardly likely that the identical series of outrages was inflicted on anyone else.

There is no difficulty in explaining the preservation of a linen cloth for 19 centuries. There are Egyptian linens 3000 years old which are still as good as new. But we have no historical record by which we can trace this cloth back to Christ. It is natural that for reasons of prudence and religion no reference to it would be made in the first few centuries A.D. Records of such a Shroud, however, do appear in the fifth and seventh centuries and, with similar gaps, down to 1355 when it turned up at Lirey, France, where it had been brought by a Crusader, Lord Geoffrey I de Charny. From then on it has a clear and continuous history.

But even without complete historical proof, there is strong evidence that this may be the cloth in which Christ was buried.

Further, the doctors of both Commissions agreed, after analysis of the bloodstains, that serum as well as blood flowed from the wound in the side, and that this is a sure sign that the man was dead when the wound was inflicted. The Gospels state that Christ was dead for about an hour when the soldier drove the lance into his side—"and immediately there came forth blood and water."

The manner in which the body was enclosed in the Shroud was also exceptional. It was customary for the ancients to wash and anoint a corpse and to swathe it in linen bands, besides wrapping it in a Shroud. In this case the corpse was simply enveloped in the long sheet which had been dusted with the usual mixture of spices, containing powdered aloes; and though the corpse was covered with sweat and blood it was not washed or otherwise prepared for burial.

This is exactly what happened with Christ's body. It was laid in the tomb enveloped only in the "clean linen cloth," just as it was taken from the cross. This happened because the Sabbath was about to begin, making it necessary to postpone the ritual burial.

Finally, the body could not have been enclosed in the Shroud long enough for decomposition to advance beyond the first stage; otherwise the imprints would have been destroyed. Again the Gospels relate that this condition was fulfilled.

Despite some scientific difficulties yet to be solved, I am convinced that our findings in the laboratory, with the Gospels as a key, confirm the traditional belief about the figures on the Shroud: that it was Christ who left the imprints on the cloth, with a vivid record of the drama of Calvary, and with His true likeness hidden in the stains till photography revealed them to the world.