

ARTICLES (3)

LOTTO V. LUWU

A LONG RUNNING INVESTIGATION BY COLIN BERRY

Hugh Farey

For several years Colin Berry has been investigating ways by which the image on the Shroud could have been manufactured, and he has finally arrived at what he hopes is a satisfactory explanation. In many ways, though, the journey has been more valuable than the final achievement, as the variety and imagination of his experiments have enhanced our understanding of many of the characteristics of the Shroud, and demonstrated inaccuracies in long held beliefs.

His exploration began with the idea that the image on the cloth was essentially a scorch, produced by the imposition of a hot statue. The image was described as looking very scorchlike by almost all the scientists of the Shroud of Turin Research Project (STuRP), although its failure to fluoresce under ultraviolet light, unlike the marks of the known scorches from the 1532 fire, led them to reject scorching as a valid hypothesis. Berry, however, investigated whether there might not have been a process which could produce a scorch which didn't fluoresce, and began work using heated horse-brasses, and later a brass crucifix picked up in a French street market. He soon discovered that, contrary to accepted credo, it was easily possible to scorch only one side of a linen thread, and even only one side of a flax fibre, and began to quantify the distance at which heat radiation was essentially ineffective. This proved to be very small, much less than the 4cm or so required by the hypothesis that a life-sized statue could have been the heat source, but he also showed that difference in contact-pressure produced difference in scorch intensity. He demonstrated that almost any scorch will produce both an effective 'negative' image, and can be converted into a '3D image' using similar software to that of the famous VP-8 Image Analyser, demolishing any miraculist claim that only the Shroud was capable of such effects.

Along the way, Berry, whose principal research job has been into dietary fibre, explored exactly what components of a flax plant cell (such a cellulose, hemicellulose, pectin or lignin) were likely to be most easily discoloured by heat, and how it might be transmitted through and along a fibre.

He also experimented with methods of producing the most 'realistic' image, as simply laying a hot model on cloth, or even simply laying a cloth on a hot model, had not been satisfactory. To ensure a good image, good contact is required, and some form of soft underlay or overlay is needed for the cloth to mould slightly around the model. This led to Berry's two designs to test: LUWU (Linen Underneath the model, With an Underlay beneath the linen) and his currently preferred LOTTO (Linen On Top, Then Overlay).

Although all this led to numerous peripheral investigations, including attempts to scorch linen in oxygen-free environments, the fluorescence problem remained, so Berry turned his thoughts towards chemical, rather than thermal, scorches, rather as Luigi Garlaschelli hypothesised when he painted a shroud with a small percentage of sulphuric acid in the pigment carrying medium. Tests involving various acidic extractions from pomegranate rind in conjunction with possible mordants like alum were not very satisfactory, so Berry turned his attention to nitric acid instead.

Alongside all the chemistry, Berry was considering the rationale that might lie behind a forger's technique. If the image was a scorch, it may have been an attempt to represent an image made by a man who had been burnt to death, such as the Templar Jacques de Molay, and if it was a chemical imprint, it may have been an attempt to represent the action of sweat on an enveloping sheet. The word 'suaire' on one of the Lirey pilgrimage badges, and the legend of Veronica's 'sudarium' were indications that this was not unreasonable. He also wondered if, since there were certainly other 'authentic' burial shrouds already in existence, this one might have been an attempt to represent the one Christ was laid in as he was lowered from the Cross. There is some biblical justification

for this, and it was certainly used as an apologia for the existence of at least two 'shrouds' in later centuries.

Covering a live model in acid was always likely to be unpopular, so Berry now proposes a two-stage model, in which something representing sweat is imprinted, colourlessly, on cloth, and the image developed on the cloth with nitric acid. To get the best impression, it turns out that a more viscous medium than sweat itself is required, so Berry experimented with various things such as milk, egg-white and starch before settling on a slurry of flour and water. This can be smeared over a volunteer and the linen cloth applied, LOTTO, to achieve the imprint. If it was appropriately viscous, the flour would not touch anything but the crowns of the threads, as observed on the Shroud. The cloth can then be heated with an iron to develop the image, or treated with nitric acid, which turns the gluten in flour yellow in a xanthoproteic reaction.

The full story of Colin Berry's research is quite difficult to follow on his two websites, but he has recently assembled it all at <https://shroudofturinwithoutallthehype.wordpress.com/> to which readers are directed if they want to find out more about his ideas, his experiments, his conclusions, and his answers to opponents. His other site is <http://colinb-sciencebuzz.blogspot.fr>.

Although Berry says he has hung up his test tubes for the present, several loose ends are still available for tying up. Although Ray Rogers was convinced there was a thin starch coating all over the Shroud, Heller and Adler, in 1988, didn't find any. And if the image relates, as the STuRP team suggested, only to the material of the Shroud and not to any coating or imprinting medium, then some interaction between the xanthoproteic events on the medium and the underlying linen should be investigated.

