RESEARCH ARTICLES (4)
HOW TO MAKE A SHROUD IMAGE WITH A SOLDERING IRON
Hugh Duncan

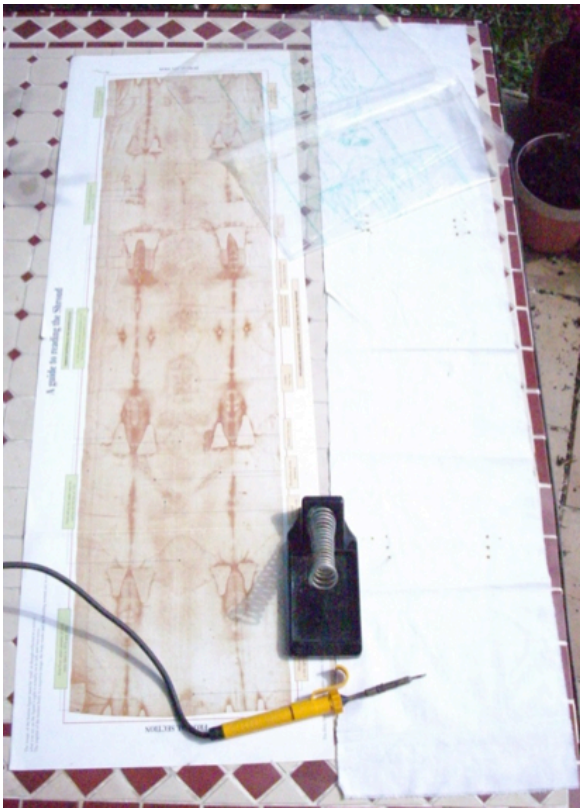
When I heard it was possible to buy a life sized replica of the Turin Shroud I was interested in getting one for myself. That was until I saw the price! That is no criticism of the quality of the copy - it is more about the state of health of my piggy bank. But no matter, I thought, perhaps I can create my own realistic copy of the Shroud. The image superficially looks like a faint burn, as might happen if a hot iron is left on a piece of material being ironed. And real burn holes and patches can be added as well as the blood stains. A soldering iron could be the 'paintbrush'. Hmmmm…

Before anyone starts a blog saying 'Hugh Duncan claims the Turin Shroud image was made with a soldering iron in the 14th century', that is NOT what I am claiming. It has already been shown that the image is not a burn, plus I don't think 14th century France had access to electrical soldering irons. However the image *looks* similar to a burn and I just want to make a replica that appears to be like the original. I would like it to also share the same photo negative properties of the original and even the 3D properties if possible.

I decided to do a pilot study first and create a 1/5 scale version. If it was successful I would move on to a full sized one. I am not an artist. I am a scientist, merely trying to replicate the appearance of an image. An art experiment if you like.

Method

Lay a transparent plastic sheet over a good 1/5 scale photo of the Turin Shroud. I used the one from 'The Shroud - A Guide' by Gino Moretto, as it was one big pull-out picture. With good permanent marker trace the outlines of the Shroud, the body image, blood flows, burn holes and patches. Lay this transparent plastic stencil over over a flat light-emitting surface (my lap-top screen lying flat and showing a white page



was perfect), and cover it with a sheet, preferably of linen, but cotton does just as well. Trace all the outlines onto the sheet. Now place a spare piece of cotton sheet onto a heat proof mat and clean the 'bit' of a soldering iron by sand papering the end and wiping it onto a spare piece of cotton sheet.

Switch on the soldering iron and allow it to warm up. Press the oval end of the bit against the cloth for different periods of time, such as 1sec, 2 sec, 3sec etc. up to 5 sec, always with the same pressure. This can be timed using a stop watch but is probably accurate enough if one just counts in a regular way. This is to create a darkness scale. The darkness of each burnt patch can be compared with the shades of darkness on the Turin Shroud's body image. For example, the darkest part of the body image could be assigned a dark scale value of 5. The faintest body image could be given a value of 1. By trial and error, one can press harder or softer until one gets a darkness of 5 with a count of 5 seconds, or by adjusting counting speed so they match up.

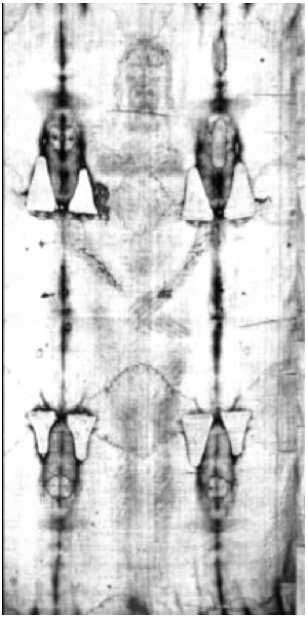
Once this is practiced and mastered, one must try using different parts of the oval end. If the oval end is pressed flat on the sheet then the smallest burn area obtained will be about 3mm x 2mm. This could be described as the 'pixel size' of the image being made. If one wanted a smaller area, then the edge or just part of the oval can be pressed. It is a bit

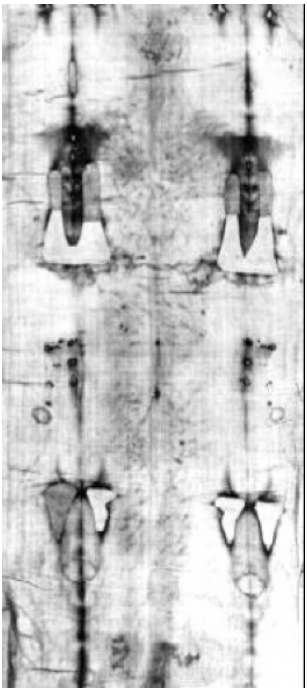
like using a pen nib in different ways to vary the width of the ink line being written. Now one is ready to start on the body image. The best method I found to replicate the body image was to have both the original image alongside and the faint pencil outline drawn onto the cotton sheet. Take the outermost edge of any body image part as the faintest and assign it a value one. Proceed to press the solder iron bit for one second on each part of the edge of the image to create the outline for all body parts. If the solder bit is moved by about 2mm each time and placed next to the previous burn oval then a continuous outline can be formed.

This process can be repeated for the whole of the body image both frontal and dorsal. By stepping back from time to time one can compare the copy with the original and readjust the burn times accordingly. For example when I did one body area and stepped back my copy was too faint, so I went over the whole area again, adding another second to the contact time. Some places, like the fingers are narrower than the solder bit hence one need only use the edge of the bit. Once the full body image is done, one can reuse the oval end of the bit to recreate the scourge marks as they are a similar size to the original ones on this scale.

Next, heat a small screwdriver in a candle flame and plunge it through the cotton sheet in the appropriate 'poker hole' places. The size and shape can be enlarged by 'jiggling' the screwdriver in the hole while it is hot enough to burn. The soot transferred from the candle flame to the cloth is ideal in mimicking the pitch detected on the edges of the poker holes. A tooth pick can be used to dab blood (or fake blood) onto the places already marked in pencil on the copy, paying close attention to the original.

I never got as far as making the 1532 burn patches as the real Shroud no longer had them and I decided to leave them out for now. Once the image is complete, it can be photographed. Once there is a photograph, make a negative version of the image. Compare the soldered images with the real Shroud.



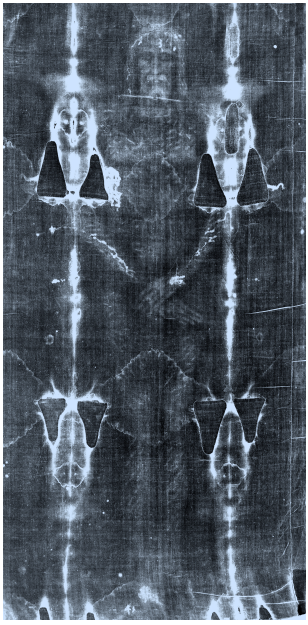


Results

The soldered Shroud and the real thing are shown in positive and negative on these pages. As the copy is 1/5 size it clearly does not have the same resolution as the real Shroud. Similarly, as the darkness of the image was judged by human eye, it has relied on the ability of the artist to recreate the original and sometimes the soldering iron was left in contact too long, so some dark parts might appear too dark. One can also see the original pencil outlines which detracts from the effect. No good method was known to remove the graphite marks. Using an eraser tended to spread the graphite powder over a larger area rather than remove it and a simple chemical removal process was not known. The blood flows on the head, arms and back look reasonable but the

flows from the spear wound do not. Not enough detail nor variation in darkness.

The negatives are generally quite pleasing and do seem to share the negative property of the original. Note the colour of the negative image (bluish) was retained as a monochrome version dramatically lost contrast. The original Shroud has also been tinted blue for easier comparison. On the next page there is a negative close up of my face image, together with its real equivalent. This part of the image seems to be surprisingly similar to the original. Perhaps it was because much more time was spent trying to reproduce it compared to any other part of the body image. Two downsides that have appeared with time are the fading of the blood



stains and the fading of the burn image itself. The photographs used here were originally only meant to be intermediate ones as they were to be replaced by final, more carefully taken pictures. However the fading of the image excluded that possibility. I want to thank my colleague Dominique Dubois, who kindly worked on the provisional images and managed to improve their quality for this article

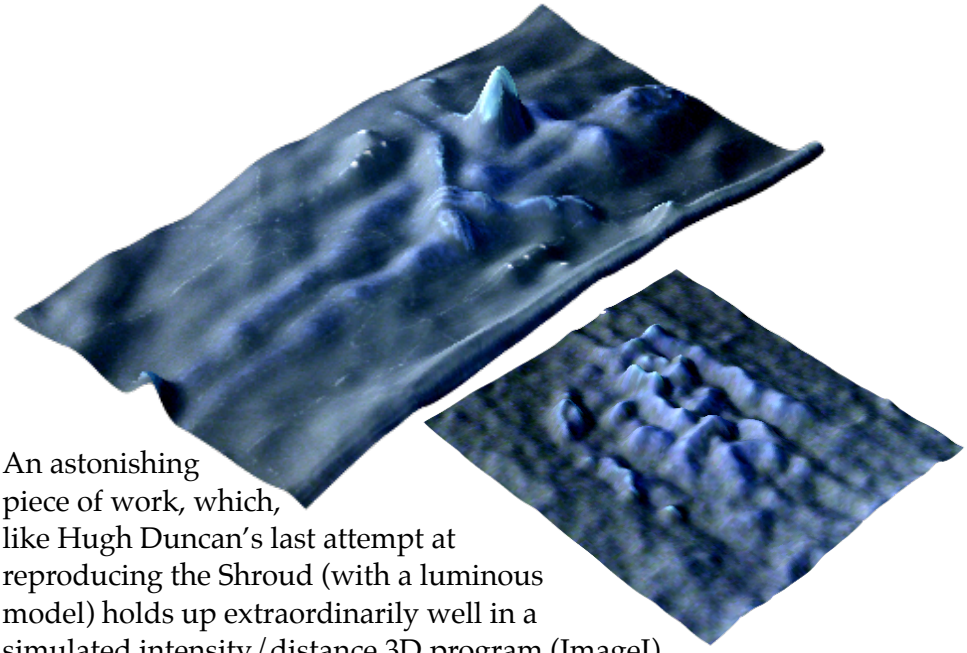
Improvements

Making a life size version would increase the resolution of the image, but being 5 times larger in dimensions would mean taking 25 times longer to create! A greater number of darkness levels could be made by pressing more lightly with the soldering iron while extending the contact times (pressing half as hard for ten seconds to create the same darkness as pressing hard for 5 sec). This would double the intensity resolution and of course take longer. To avoid the pencil lines, one could project the real Shroud image onto the cloth to be soldering ironed or shine one from below. As the burn image fades one could start by making the original a darker shade to compensate for the fading so that in the long term the image would reach the correct darkness. Again this would increase the time to make the image. It would be interesting to see if this image shows

the same 3D properties of the real Shroud image, though I would expect it to as this was an attempt to replicate the original one's appearance.

Conclusion

It has been possible to make a mini replica of the Turin Shroud using a soldering iron to burn on the image. The image lacks enough levels of darkness, but superficially it is similar to the original. It also shares the same negative qualities as the original and might also show some 3D properties. The image sadly fades with time. A full sized version, with suggested improvements is possible though probably very times consuming. The quality and accuracy of the image depends very much on the artistic skills of the person creating the image. There is one positive outcome from doing the experiment: I was forced to observe very carefully every tiny detail on the Shroud and I feel I have a much better appreciation of the image!



An astonishing piece of work, which, like Hugh Duncan's last attempt at reproducing the Shroud (with a luminous model) holds up extraordinarily well in a simulated intensity/distance 3D program (ImageJ).