



The Holy Face in bas-relief

A BAS-RELIEF
FROM A PHOTOGRAPH OF THE HOLY FACE

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The three-dimensional figures obtained by Drs. Jackson and Jumper and Prof. Tamburelli are images in perspective on a screen. My experiment is different in that I obtain directly a tangible relief, a sort of sculpture. The analysis of the image and the production of the sculpture are simultaneous.

By means of an optic system, a luminous ray explores a photograph of the Shroud line by line. The reflection of the luminous ray on the photo is captured by photo-sensitive cells, which electronically work a signal creating, in an apparatus of permanent magnets, an electro-propelling-force. The EPF is variable in function of the variation of luminous intensities captured by the cells; or, in other words, in function of the "values" (from the brightest to the darkest) of the photograph of the Shroud. The EPF activates a mechanical system equipped with a stylus which is moved vertically, up and down. To each line of the photo explored by the cells, the stylus simultaneously cuts a corresponding groove in a matrix of a soft translucent material. When the cells capture a value more or less bright, the stylus descends more or less deep, making the corresponding groove at that place.

The result is a negative bas-relief. The translucence of the material gives it a luminous quality and the effect of relief is quite startling. A supple plastic mold is then turned into the negative, and thus we obtain the "tangible" 3D image of the Holy Face.

Jackson and Jumper have demonstrated that on the VP8 analyzer, a normal photograph gives a distorted image. Likewise, if I place a normal photo on my machine, I obtain an image completely deformed by cast shadows.

The image of Christ on the Shroud is totally devoid of shadows and lights.

The same is not true of the support of the image, i.e., the fabric itself. The lights and shadows irregularly dispersed over the fabric are reproduced in photographs as little luminous points surrounded by shadows (Fig. 1). The photograph reproduces these cast shadows between the threads of the fabric, and also the luminous points which appear on the top of the threads.

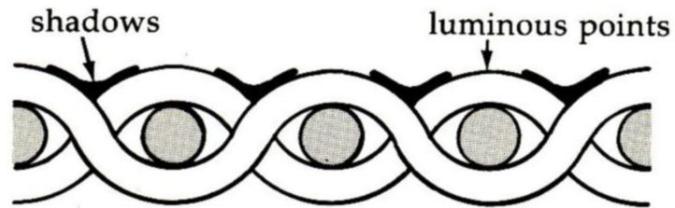


Fig. 1: Diagram of a cross-section of fabric.

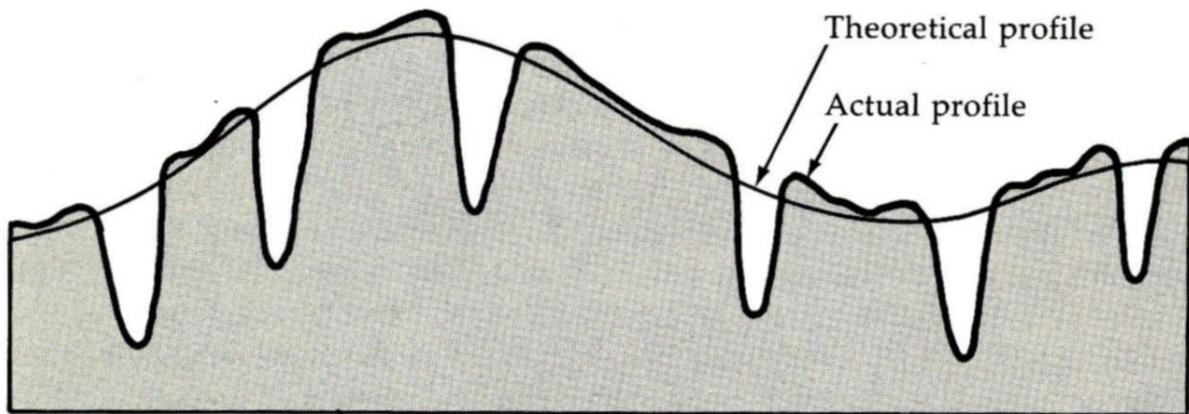


Fig. 3: On the photograph, each parasite bright point is very small, but the contrast between the bright point and the surrounding surface is considerable. The negative relief obtained by the machine renders these bright points as narrow but deep indentations.

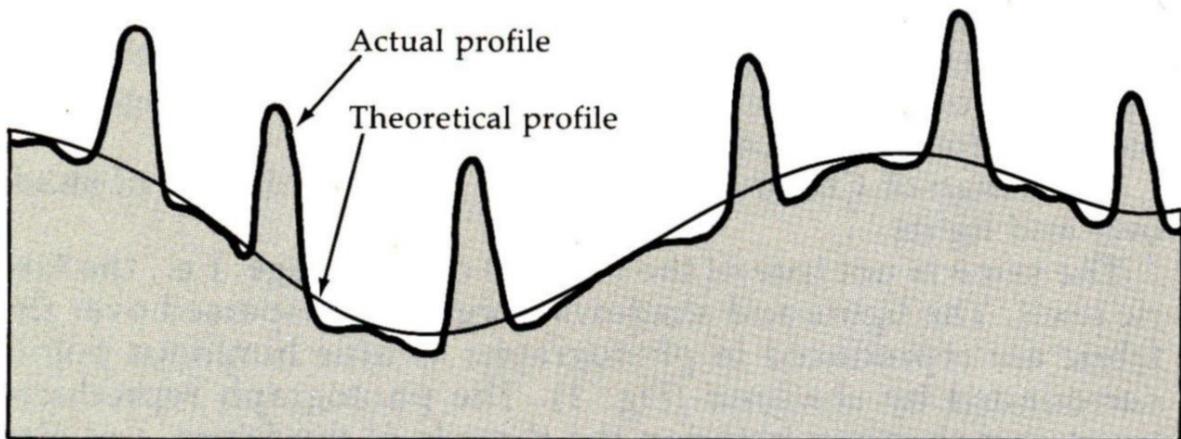


Fig. 4: The mold gives a positive relief.

The machine detects all these values point by point, and the stylus cuts the matrix to a depth in proportion to the brightness of the explored point. The little luminous points, therefore, are rendered as deep narrow pits strewn irregularly over the negative relief (Fig. 3).

When the positive relief is obtained on the mold, these little pits show up as narrow but prominent parasite asperities (Fig. 4).

Unfortunately, a 3D image obtained from a photo of the Shroud can never be perfect. Antoine Legrand provided me with a photo which reproduces almost exactly the coloration and intensity of the Face of the Shroud. From this photo, I was able to obtain an attenuated effect of the parasite asperities.

A direct exploration of the Shroud would permit the detection of the exact value of each point of the image without these parasite shadows and highlights. Even the disastrous effects of the creases in the Cloth would be eliminated. But to obtain a sculpture of the Shroud image in natural size, exact in its three dimensions and without any parasite asperities, one would have to devise a machine capable of exploring the entire surface of the Shroud. The principle I used for the movement of the stylus would no longer be applicable. But it seems to me that some system of analysis is technically possible. However, this would entail not only enormous expense, but an extended period of direct access to the Shroud.

Perhaps the exact three-dimensional reproduction of the Holy Shroud may never be realized.



Gold plated medal of the bas-relief.