Image Formation on the Shroud of Turin

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Abstract

The Shroud of Turin contains good-resolution full-size images, without pigment, of the front and back of a naked crucified man. This paper proposes a multi-step process for formation of these images on the linen Shroud. By following the evidence on the Shroud where it leads, without a presupposition of naturalism, a hypothesis for image formation can be hypothesized that is consistent with all the evidence on the Shroud. The proposed hypothesis involves radiation emitted in the body that carries the information to the Shroud that is required to control the mechanism that discolors the fibers in the threads that make the image. This information is that which defines the appearance of a naked crucified man. We can see the image on the Shroud because this information has been encoded into the pattern of the discolored fibers that make the image. The proposal includes the radiation discoloring the fibers by a static discharge from the top portions of the fibers facing the body, resulting in electrical heating and possible production of ozone that discolors the fibers. This process naturally results in a negative image that contains 3D or topographical information, threads with a mottled appearance, and microscopic properties that are consistent with the Shroud.

Hypothesis

To solve how the image of a naked crucified man was formed on the Shroud of Turin, researchers must carefully follow the evidence on the Shroud where it leads without being restrained in their considerations by assumptions, such as a philosophical assumption of naturalism. This is required to allow the researcher to approach the problem of image formation with a neutral mindset (Section 3 of Ref. 1). Most Shroud researchers believe that the evidence on the Shroud indicates that the image could not have been formed by an artist or forger, but that in some unknown way the body that was wrapped in the Shroud encoded an image of itself onto the cloth (Ref. 2 and 3). This is the starting point for this proposal.

To be consistent with the evidence on the Shroud, it is proposed that the image on the Shroud was formed by a multistep process. This proposal starts with radiation being emitted from the body to carry the required information (the information that defines the appearance of a naked crucified man) from the body to the cloth (Ref. 4). This information is required to control the mechanism that discolors the fibers so that only the right fibers, and the right lengths, would be discolored so that the good-resolution image of the crucified man could be formed on the fabric. This information was carried, transported, or communicated from the body to the linen Shroud, and deposited there, by the energy, intensity, and direction of the radiation (Ref. 5). Thus, we can see the image of a crucified man on the Shroud because the information that defines the

appearance of a crucified man has been encoded into the pattern of discolored fibers on the Shroud. Reflected light carries this information from the Shroud to our eyes so that our brains can recognize the image of the crucified man, just like reflected light carries the information from a photograph to our eyes so that our brains can recognize the image in the photograph.

The radiation not only had to be emitted from the surface of the body, but it had to be emitted from within the body because we can see bones on the Shroud, including teeth, bones in the hand, etc. The radiation had to be emitted within the body to carry to the linen cloth the information regarding the presence of these bones in the body. Since there was no lens between the body and the cloth to focus this radiation, the radiation had to be emitted in vertically collimated directions up and down, like a billion vertically oriented lasers going off simultaneously within the body. In this way, each point on the cloth could be affected by only one point on the body (the point directly above or below it) so that a good resolution image could be formed without a lens. The main type of radiation that caused the image is believed to be charged particles (Ref. 6) such as protons and electrons, but low energy electromagnetic radiation (Ref. 7 and 8) such as infrared, visible light, and ultraviolet might have also contributed to forming the image. Highly penetrating radiation such as neutrons, X-rays, and gamma rays are not believed to be primarily responsible for the image because if this were the case, then the image would have been just as strong on the outside of the wrapped configuration as on the inside of the wrapped configuration (toward the body), which would be contrary to the evidence on the Shroud. To be consistent with what we see on the Shroud, the radiation had to be emitted in an extremely short intense burst, as in Ref. 8, to explain why it only effected the top one or two layers of fibers on the threads. This intense extremely short burst of charged particle radiation would produce a strong charge on the fibers in the linen thread of the Shroud, which would cause a static discharge from the highest fibers facing the body in the threads, consistent with the location of the discolored fibers on the Shroud. This static discharge from the top sections of fibers in the threads would include high current flow from the surrounding section of the fabric to the fiber that is undergoing the static discharge, which would produce significant heating of the fiber and possible production of ozone. Both the electrical heating and possible ozone could discolor the top portions of the fibers.

Two of the very unusual characteristics of the image on the Shroud are the apparent negative image on the Shroud, with dark and light areas reversed, and 3D or topographical information present on the Shroud. These aspects of the image naturally result from the above concept of image formation. As the radiation travels vertically across the air gap between the body and the cloth, it will naturally undergo absorption and scattering, and possibly also decay. These three processes can diminish the intensity of the radiation, so that the effect of the radiation on the cloth will be strongest where the distance between the body and the cloth is a minimum, such as the tip of the nose where the cloth would have been in contact with the nose. At distances to either side of the tip of the nose, where the vertical distance from the body to the cloth increases, the intensity of the radiation will naturally diminish as it travels across a greater vertical distance. Thus, the extent of the fiber discoloration will be a function of the vertical distance between the body and the cloth, with no fiber discoloration if the vertical gap is over about 3 or 4 cm. In a photograph of a person, the tip of the nose is bright because it is in an exposed position on the face where it readily reflects light, but on the Shroud, the nose is dark because the radiation reaching that location has not been diminished by absorption, scattering, or decay. This

light/dark reversal causes the apparent negative image. And the intensity of the radiation diminishing as a function of the gap distance causes the 3D or topographical information to be present in the pattern of discolored fibers on the Shroud. This is what allows a 3D statue to be generated from the image on the Shroud (Ref. 9). This type of 3D information that is on the Shroud is not present in photographs, paintings, or drawings so the image on the Shroud cannot be a photograph, painting, or drawing.

On the Shroud, the discoloration on the threads shows a mottled appearance. This mottled appearance is due to the discolored fibers being grouped together on a thread with large portions of each thread having few if any discolored fibers. The image encoding process discussed above automatically produces this mottled appearance of the threads. This is because the discolored fibers are grouped together where the electrical discharge took place, with no discoloration where the electrical discharge did not take place. This can be called a "lightning rod" effect because it is similar to lightning hitting the tip of one lightning rod, but no other lightning rods in the area. This lightning rod effect can be explained as follows.

Assume a fairly level plain but with some points higher than others, with many lightning rods distributed over it, so that some lightning rods can be somewhat higher than others. As a thundercloud passes over the ground, an electrical charge builds up between the ground and the cloud. In general, the largest charge difference will be where there is a minimum distance between the tip of a lightning rod and a low point in the thunder cloud. When this charge difference becomes large enough to ionize some of the atoms in the air by stripping off an outer electron from the atoms, it very quickly forms a cascade of ionized atoms resulting in a lightning strike to the tip of one of the lightning rods, probably the highest lightning rod. But when this first lightning strike occurs, the electrical charge travels in the earth toward the one lightning rod thus tending to discharge the other lightning rods on the plain, and electrical charge travels in the clouds to the one location where the lightning originated in the clouds thus tending to discharge the other locations in the clouds. This explains why lightning will tend to strike only one lightning rod in a broad area.

This lightning rod effect explains the formation of the mottled appearance of the threads on the Shroud, where the discolored fibers are the highest points facing the body on the threads, with the discolored fibers grouped together and other areas of the threads having few if any discolored fibers. Of course, on the Shroud, the charge difference that caused the static discharge from the top portions of the fibers was not formed by thunder clouds rubbing against the fabric, but by the extremely brief powerful burst of radiation that was emitted from within the body and was deposited on the Shroud. This radiation, which is primarily believed to be charged particles, deposited the electrical charge on the fabric of the Shroud that caused the static discharge from the fibers that discolored them.

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Biography

Robert A. Rucker earned an MS degree in nuclear engineering from the University of Michigan and worked in the nuclear industry for 38 years primarily in nuclear reactor design, nuclear criticality safety, and statistical analysis for quality control of nuclear material inventories. He holds Professional Engineering (PE) certificates in nuclear engineering and in mechanical engineering. He organized the International Conference on the Shroud of Turin (ICST-2017) held July 19-22, 2017, in Pasco, Washington. His papers can be downloaded from the research page of his website at http://www.shroudresearch.net/research.html. Send comments, questions, or corrections to robertarucker@yahoo.com.