Criteria for Evaluating Image Formation Hypotheses for the Shroud of Turin

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Abstract

Multiple hypotheses have been proposed to explain how the front and dorsal images of a crucified man were formed on the Shroud of Turin. This paper recommends criteria for judging the merits of a particular image formation hypothesis. Criteria include: 1) to be true, a hypothesis must be consistent with all the scientific evidence that is true about the images, 2) the hypothesis should make predictions that are testable, falsifiable, and possibly unique, and 3) a hypothesis is preferred over other hypotheses if it: a) explains multiple aspects of the Shroud, b) is simple rather than complex, c) is recognized as having "beauty", d) discusses aspects of the images that the hypothesis does not explain, e) is corroborated by one or more diverse areas of study, and f) discusses how information was used to form the images.

1. Introduction

In general terms, a hypothesis is a proposed concept for explaining observations about a phenomenon. The Shroud of Turin is a linen cloth that contains front and dorsal images of a crucified man. This paper will consider the criteria that should be used to judge the merits of the various hypotheses to explain how these images were formed on the Shroud of Turin. Many people seem to think that if an image formation hypothesis proposes a mechanism that can discolor linen fibers, that this hypothesis must therefore be how the images were formed on the Shroud. However, the fact that a particular hypothesis has been proposed does not make it true. A particular hypothesis could be judged by different researchers to be true or not in the following ways. It could be judged to be: 1) definitely not true, 2) probably not true, 3) possibly true or not true, 4) probably true, or 5) true beyond a reasonable doubt. Different researchers could take different positions among these options. According to the scientific process, a conclusion of the truth of a particular hypothesis requires a consensus of expert opinion, and even with such a consensus, the conclusion should often be held with a degree of tentativeness to allow for future new evidence.

How a hypothesis reproduces the face on the Shroud is often thought of as the best test, in a macroscopic sense, of whether the hypothesis could be true. In researcher's attempts to develop image formation hypotheses, the best image of the face on the Shroud was produced by radiation controlled by information (Figure 7c in Ref. 1). The author's VCRB (Vertically Collimated Radiation Burst) hypothesis for image formation (Ref. 2) also proposes that the images were formed by radiation controlled by information. Information is necessary to control which fibers are to be discolored and the length of that discoloration so that the images could be formed on the Shroud. How the information required to control the image formation process was delivered to the Shroud should be discussed in an image formation hypothesis.

2. Criteria for Judging an Image Formation Hypothesis

The criteria for judging hypotheses for image formation can be separated into three categories: 1) "it must", 2) "it should", and 3) "it is preferred".

(3.1) For a hypothesis to be true, it must be consistent with all the evidence that is believed to be true. If a hypothesis contradicts any evidence known to be true, then the hypothesis cannot be true. A hypothesis that is consistent with all the evidence may be true but is not necessarily true. If a hypothesis claims to be consistent with only a few of the evidences, but makes no claim about being consistent with the remainder of the evidences, then initially it is probably less credible than a hypothesis that claims to be consistent with more of the evidences, even if it also makes no claim about the remainder of the evidences. The VCRB hypothesis (Ref. 2) claims to be consistent with the 27 evidences from which it is derived. While a hypothesis must be consistent with all the evidence to be true, it usually gains sufficient credibility to be considered true based on its predictions. If a hypothesis makes no predictions, then how can it gain sufficient credibility to be considered true?

(3.2) A hypothesis should make predictions that are testable and falsifiable. If a prediction is tested and found to be true, then the hypothesis gains in credibility, though it may not yet be considered as proven to be true. It may take multiple predictions to be tested and proven to be true before the hypothesis is considered by the majority of researchers to be true beyond a reasonable doubt. If a prediction is tested and found to be false, then the hypothesis is proven to be false, at least as stated. It is important that a prediction be falsifiable, i.e. capable of being proven false when tested. A prediction that cannot be proven false when tested is of questionable benefit if proven to be true. A unique prediction is a prediction that no other hypothesis makes. For example, the VCRB hypothesis makes a unique prediction about the distribution of the carbon dating across the Shroud. If a unique prediction is tested and found to be true, then it can significantly add to the credibility of the hypothesis. Depending on the nature of the unique prediction, if proven to be true when tested, it may add sufficient credibility to the hypothesis that many would consider the hypothesis to be proven true.

(3.3) Six items can be considered in the "it is preferred" category.

(3.3a) A hypothesis is preferred if it explains more than one mystery of the Shroud. Scientists usually consider a hypothesis to be more attractive if it explains multiple aspects of a phenomenon, though this alone would not prove the hypothesis to be true. For example, the VCRB hypothesis proposes explanations for the image formation, the 1988 carbon dating of the Shroud, and possibly why the blood that would have dried on the cloth is now on the Shroud, since dried blood does not normally absorb into cloth. Further consideration should be given to whether other image formation hypotheses can explain other mysteries of the Shroud.

(3.3b) A hypothesis is preferred if it is simple rather than complex. Scientists prefer to deal with a hypothesis that is simple rather than complex because it is easier and is sometimes assumed to be more likely true. However, a hypothesis should not be rejected based on its complexity because reality can be complex. For example, the VCRB hypothesis is relatively complex but its complexity results from the complexity of the evidence. This preference for simplicity is often

called “Occam’s razor” when phrased as a preference for as few assumptions as possible, though it is often difficult to count the number of assumptions because of how they can be interrelated. In the VCRB hypothesis, there is one basic assumption related to the cause of the front and dorsal images – that the nuclei in the body experienced a vertical oscillation that was so strong and at such a high frequency that a small fraction (0.0004%) of the deuterium nuclei split. This resulted in a release of vertically oriented protons that formed the images and vertically collimated neutrons that shifted the carbon date forward from the true date. The principle of Occam’s razor can also be expressed as a preference for the hypothesis that has the simplest assumptions, though the degree of simplicity vs. complexity can be open to interpretation. This preference for simple assumptions appears to be based on the assumption that complex assumptions are less likely to be true. This preference for simplicity can be a useful tool when dealing with multiple hypotheses that otherwise have equal merit in that they are consistent with all the evidence and have made predictions that testable, falsifiable, and possibly unique. While this preference for simplicity should not be used to reject a hypothesis, because reality can be complex, it can be used to focus research effort on one hypothesis rather than others.

(3.3c) A hypothesis is preferred if it exhibits “beauty”. Beauty in science or mathematics is something that researchers can find attractive, but it can be difficult to describe because beauty is often “in the eye of the beholder”. For example, beauty in a hypothesis can be related to symmetries, similarity of patterns, relations of the more complex to the simpler, familiarity with the form of the equations, the way in which the equations can be simplified, etc. Recognition of this beauty can cause a feeling of joy and satisfaction in the researcher. As with criteria 3.3b, this preference for beauty should not be used to reject a hypothesis but can be used to focus research effort on one hypothesis rather than others.

(3.3d) A hypothesis is preferred if it discusses aspects of the images that it does not explain. Examples include: 1) the normal width of the face on the front image appears to indicate that when the front image was encoded, the cloth was essentially flat above the head rather than wrapped around it, and 2) the lack of flattening of the buttocks and back on the dorsal image appears to indicate that when the dorsal image was encoded, the body was above the dorsal half of the cloth. Thus, when the images were encoded, the body appears as if it was located above the cloth that was below it, and that the cloth above the body was essentially flat and at least a small distance above the body. A good explanation for these features has not been documented and the VCRB hypothesis does not propose an explanation. However, since the electromagnetic force is so much stronger than the gravitational force, since like electrical charges such as two protons will repel each other, and since the VCRB hypothesis involves electrical charge distributions, these considerations suggest that these features of a levitated body and a levitated top cloth might be explained by the repulsive forces resulting from the bottom cloth, the body, and the top cloth all having a net electrical charge such as a net positive charge. But the VCRB hypothesis does not explain how these electrical charge differences could have come about.

(3.3e) A hypothesis is preferred if it is corroborated by one or more diverse areas of study. For example, the VCRB hypothesis is corroborated by two diverse areas of study: 1) there is a good correlation between the predicted distribution of neutron absorption on the Shroud (Ref. 3 and 4) and Tom McAvoy’s study of the distribution of the fluorescence on the Shroud (Ref. 5 and page 22 of Ref. 4), and 2) the conclusion of the VCRB hypothesis that the discoloration on the fibers

that caused the images was caused by a high frequency vertical oscillation of the nuclei in the body could be the mechanism by which Jesus' body transitioned to an alternate dimensionality, as concluded in Biblical and scientific studies of how Jesus' body disappeared in his resurrection (Ref. 6 and 7).

(3.3f) A hypothesis is preferred if it explains how information was used to form the images on the Shroud. Every image that can be seen is due to information controlling the image formation process. For example, information is needed to control the sequence of letters and the grammar in a book or magazine, and information is needed to control the pattern of pixels that form the letters in a book or magazine. Information is needed to control the pattern of pixels in any image that can be seen including in a photograph, magazine, television, or computer monitor. This also applies to the Shroud of Turin. On the Shroud, information is needed to control the pattern of the discolored fibers that are in the front and dorsal images, both their location and length. Thus, a document that proposes an image formation hypothesis should clearly discuss the specifics regarding the information that controlled the discoloration on the fibers, since it is the discoloration on the fibers that forms the images. For example, where did the information come from, how was the information transported to the cloth, how was the information deposited on the cloth, and how was the information involved in discoloring the fibers? The VCRB hypothesis proposes that the information required to form the images was communicated from the body to the cloth by radiation emitted in the body, was deposited on the cloth when the radiation was absorbed by the cloth, and the fibers were discolored by the energy in this radiation.

3. Conclusion

The criteria for evaluating a hypothesis for image formation can be summarized as follows:

1. For a hypothesis to be true, it must be consistent with the evidence.
2. A hypothesis should make predictions that are testable, falsifiable, and possibly unique.

3a. A hypothesis is preferred if it explains more than one mystery of the Shroud.

3b. A hypothesis is preferred if it is simple rather than complex.

3c. A hypothesis is preferred if it exhibits "beauty".

3d. A hypothesis is preferred if it discusses aspects of the Shroud that it does not explain.

3e. A hypothesis is preferred if it is corroborated by one or more diverse areas of study.

3f. A hypothesis is preferred if it explains how information was used to form the images on the Shroud.

These criteria are used to evaluate some of the proposed image formation hypotheses in Ref. 8.

10. References

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