

FORWARD to FALL-THROUGH HYPOTHESIS

In 1990, I published a paper entitled “*Is the image on the Shroud due to a process heretofore unknown to modern science?*” in the Journal, *Shroud Spectrum International*. Nearly a quarter of a century has passed since this publication. Nevertheless, the basic hypothesis of this paper still represents my current thinking on the image formation problem of the Shroud, although this hypothesis has matured considerably since then with the help of my colleagues at the Turin Shroud Center of Colorado (TSC).

In the **Critical Summary** found on this website, a variety of image formation hypotheses are analyzed, including mine, which is referred to in the **Critical Summary** as the “Radiation Fall-Through” hypothesis. Because this hypothesis may likely be unfamiliar to many readers of this website, I have decided to place the text of my 1990 paper in its entirety on the TSC website in order to provide the readers with a coherent understanding of the hypothesis, how it was derived, and how it explains all the known characteristics of the Shroud image.

It will be noted that this hypothesis was published in 1990, nearly two years after the radiocarbon dating of the Shroud to the Middle Ages. Nevertheless, the scientific logic of the 1990 paper is based strictly upon the image characteristics of the Shroud, none of which depend upon the radiocarbon date that has been proposed for the cloth. Herein lies a dilemma: If both the radiocarbon result and the Radiation Fall-Through hypothesis are correct, then how was the image formed in the Middle Ages according to a process that is, as the title of the 1990 paper describes, “heretofore unknown to modern science?” Indeed, the 1990 paper concludes with the following statement: “*It might be that a simple piece of cloth, known as the Shroud of Turin, represents a valid case for rethinking certain concepts of modern science. To this end, I would encourage my colleagues in science to realize that the image on the Shroud of Turin is far from being defined by one radiocarbon test, but could be one of history’s greatest scientific puzzles.*”

I should also mention that since the publication of the 1990 paper, we at TSC have developed an archaeological/historical argument, based on an observation of the Shroud that I made during the 1978 STURP examination of the Shroud, against the validity of the radiocarbon date. This study indicates that the Shroud cloth itself (as opposed to the image) is significantly older than what

radiocarbon analysis has ascribed to that cloth. This argument is briefly described in L6.0 of the **Critical Summary**, but the complete scientific details and analysis of it are, to my mind, sufficiently compelling that we now have legitimate grounds for disputing the radiocarbon result of a medieval date.

The 1990 paper made a prediction that could test the Radiation Fall-Through hypothesis, but at that time this was not possible because a backing cloth sewn onto the Shroud prevented proper access to the reverse side of the Shroud. The 1990 prediction was that the frontal image of the Shroud should appear on both the inner and outer surfaces of the cloth (as it wrapped the body), while the dorsal image should appear only on the inner surface. The reason for this difference is explained in the 1990 paper. In 2002, the backing cloth was unexpectedly removed from the Shroud during a conservation alteration which showed a **doubly** superficial frontal image (i.e. face, hair and possibly hands on the outer surface, albeit of lower contrast as compared to the inner) and a **singly** superficial character of the entire dorsal image (i.e. no evident dorsal image on the outer surface). These observations appear to be consistent with the 1990 prediction. Indeed, Image Characteristics **C3.0** and **C3.1** of the **Critical Summary** now include these important new observations.

I realize that I might be accused of using Christian Biblical Theology to construct the Radiation Fall-Through hypothesis, particularly because I am a Christian; but I did not. My concern as early as 1976, fourteen years before the 1990 paper, was one of physics - how to reconcile the 3-D characteristic of the Shroud image with its high resolution. I described this concern mathematically in a paper for the Proceedings of the 1977 United States Conference of Research on the Shroud of Turin entitled, "*A problem of resolution posed by the existence of a three-dimensional image on the Shroud.*" This problem, in fact, persists to this day as can be seen from the Image Characteristic versus Image Formation Hypothesis Table of the **Critical Summary**; compare rows **B2.0** (High Resolution) and **B3.0** (3-Dimensional) for which no hypothesis, except the Radiation Fall-Through hypothesis, is indicated as simultaneously satisfying both image criteria. Moreover, a careful reading of the 1990 paper will show that the logic of the Radiation Fall-Through hypothesis does not, in any way, depend upon or require an assumption arising from Christian theology; rather, the logic arises strictly from what is observed on the Shroud of Turin image.

Having said this, I would be remiss not to point out that the Radiation Fall-Through hypothesis predicts that, after the image formation event, the cloth would be collapsed on the ground with no physical body present. In principle, this set of simple observations could be tested via the Scientific Method if associated observational data were to exist. If we were to regard the recorded observations of the Easter Tomb of Jesus found in the Christian Gospels as providing such observational data, then we find direct agreement with the above prediction of the Radiation Fall-Through hypothesis, i.e. a collapsed cloth and no body.

This agreement compels this author to pose two intriguing questions for consideration: (1) Might such a correspondence of the Radiation Fall-Through hypothesis with the Biblical accounts be an indication of the Shroud's authenticity and (2) could the hypothesis be possibly a model of the physical interaction of the Shroud to the Resurrection event itself, a concept that has been believed by Christianity for nearly two thousand years?

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