

## SPECIAL FEATURE

### *Knowing a Hawk from a Handsaw*

by Alan D. Whanger, M.D.

[Dr. Alan Whanger submitted this article quite uninvited, as a spirited response to the Editorial 'Very Like a Whale' that appeared in the last Newsletter. Although some readers may find it repetitive and overlong, the article is reproduced here in near-entirety both because of the author's undeniable professional expertise, and in the interests of this Newsletter presenting a balanced spectrum of all opinion on the Shroud. Despite Dr. Whanger's forcefully-presented arguments, the Editor's personal opinions as expressed in the last Newsletter remain undiminished]

I was disappointed by the recent unfortunate editorial in the *Newsletter* of the British Society for the Turin Shroud [No.46] in which our (my wife and co-researcher Mary and I) work is anonymously castigated. The editor even quoted Shakespeare via Hamlet and Polonius to indicate that our imagination far exceeds our data.

Indeed, if one tries to see the overall picture or image, one has to step back from the object, whether it be the Shroud or otherwise. However, as I learned in my histology and microscopic technique courses in 1952, if one wants to see details one must get in close with appropriate materials, instrumentation, and procedures. Having spent over three and a half decades at a major research university from which I retired in 1993 as a tenured Professor, I feel that I am rather well acquainted with research techniques and procedures.

When my wife and I began our serious Shroud research in 1979, we were challenged to find a way to do exacting comparisons between two different objects or images. By 1981, we developed our Polarized Image Overlay Technique (*Applied Optics*, Vol. 24: 766-772, March 15, 1985) which enables detailed, repeatable, recordable, and quantifiable image comparisons. To determine the validity and significance of our observations, we usually use standard forensic criteria.

Through the courtesy of **Father Francis Filas, S.J.**, who owned copies of the negatives of photographs of the Shroud taken by Enrie in 1931, we obtained over thirty very high-grade photographs. Some of these were photographically enhanced to better show details, and these have been the basis for much of our research. I have spent many thousands of hours examining these photographs in detail for patterns that do not follow the weave and which resemble objects. By comparing these patterns (images on the Shroud) with photographs of actual objects, we have identified on the Shroud the presence of a large number of images of various objects. To help identify these objects, I have carefully examined literally hundreds of books and journals (in the Duke University libraries and elsewhere) on early art, archaeology, iconography, Jewish and Middle Eastern customs and artifacts, history, comparative religions, image production and analysis, and a variety of other topics. And I have worked extensively with a German physicist who has made

large numbers of images by corona discharge (one of the types of radiation that produces images like those on the Shroud) of many objects and flowers for comparison and identification.

I presume that the instigation for the editorial was the release into the media on 11 April 1997 of information on the flower images. Unfortunately, much of the editor's information is incorrect. The news story on the flower images was released by the Research and Science News Service of Hebrew University in Jerusalem, and cited the confirmation of the flower images on the Shroud of Turin by **Professor Avinoam Danin**, who is the leading authority on the botany and flora of Israel. He is currently writing his sixth textbook on the topic.

After careful study, Professor Danin confirmed the identity of the twenty-eight species of plants we had previously tentatively identified, quickly identified another, and confirmed the presence of large numbers of additional flower images most of whose species cannot be clearly identified because of their wilted and crowded condition.

Nowhere in any of our statements or writings have we ever indicated that images on the Shroud of flowers and other objects "will loom into one's vision" if only one looks closely enough. Repeatedly, we have pointed out that these images are very difficult to see. Often seeing them is not possible unless one knows the characteristics of Shroud images and also has very high quality, enhanced (not morphed) photographs. The images are of very low contrast and often are partial or fragmentary and may be imbedded in other images or marks. It also helps to know what the various objects look like (hence the necessity for the library research mentioned above) and to have a means of accurate image comparison. Unless one has all of this, one is not likely to perceive what is actually there. In addition, people vary widely in their ability to perceive imbedded images. Professor Danin is one of the most perceptive individuals I have ever seen.

The Editor has apparently fallen victim to a standard ruse used by detractors and debunkers of the Shroud who claim that sindonologists are religious enthusiasts who are so eager to authenticate the Shroud that they conjecture or imagine all types of things on or related to the Shroud. Having received from various persons over the years a number of highly exotic and creative drawings, papers, and diagrams having to do with the Shroud, I am well aware that this occasionally happens. Since the Shroud images are partial and of low contrast, they quite understandably lend themselves to speculation and a variety of interpretations. An essential criterion in determining the validity of one's observations is whether the image in question demonstrably corresponds with a known object or structure. In more scientific terminology, is the conclusion consistent with the data?

In order to correctly perceive what is actually on the Shroud, one must understand not only the nature of the images but also the physiology of visual perception. The retina of the human eye has the built-in characteristic of automatically suppressing images which are fuzzy or of very low contrast in order to sharpen what is finally perceived. This ordinarily helpful function creates a problem when viewing the Shroud, since one may not perceive

images which are actually there. Various enhancement techniques are necessary to correctly discern some of the images. Also, most people are not accustomed to looking at partial, complex images in the negative, and hence miss much of what is actually there. If one's visual memory banks are not programmed with a large number and variety of images, one may simply overlook images that are unfamiliar.

As we and others demonstrated and published in the 1980s, many of the Shroud images have the characteristics of images produced by electron corona discharge. This means that the images are partial, having come off of irregular surfaces, high points, and margins; and they have many of the characteristics of a photographic negative. As we later demonstrated and published in 1994, some of the images also show characteristics of x-radiation, in that parts of the skeletal system are visible on the Shroud. This has been confirmed by a number of Professors of Radiology. The images on the Shroud are visible and accurate within a fraction of a millimeter.

### **Difference to Rorschach**

Many claim that the big problem is people seeing what is actually not there. I think that the far more serious problem is people not seeing what is actually there and then discrediting or ridiculing those who do perceive. I think many of those who dismiss our troublesome findings by branding them as "pictures in clouds" do not clearly understand the difference between a Rorschach test and image analysis. While image analysis is not an exact science, there are a number of principles involved which help distinguish imagination from observation. These include clear definitions of what one is measuring or comparing, methods of consistent observation and documentation, appreciation of pattern recognition, use of comparative templates, and an understanding of statistical probabilities. As mentioned and described in our *Applied Optics* article in 1985, and with relevant slides and descriptive material available from the Holy Shroud Guild since 1984, and as demonstrated in many videotapes that we have made over the years, our polarized image overlay technique provides a rather simple way to do rather complex analysis.

### **Coins over the eyes?**

This is most helpful in evaluating images such as the coins over the eyes or facial features in icons, which have a great deal of detail. A template comparison of a monotypic or simple image between a coin and the eye image, for instance, is very similar to fingerprint identification in which such small features such as ridge endings and bifurcation's (called "minutiae") are examined. If there are as few as 14 of these coincident features (which we call "points of congruence") this is sufficient forensically to declare that these are identical and from the same person. This is because the mathematical probability of such a match up between two unrelated or random fingerprints yields a fraction whose denominator exceeds the population of the world.

We have tabulated and documented for anyone who cares to look, 211 points of congruence between the computer enhanced image over the right eye of the Shroud and the Pontius Pilate coin of Filas (seen right). This is in an area about 2/3 the size of a

fingerprint. We tabulated only 86 discordant points in the same area. A coin is different from a fingerprint since the latter are unique, and a coin is struck from a die and hence theoretically reproducible a number of times. The ancient Jewish coin dies were crudely carved and hand struck, and were made of cast iron and so would break often, perhaps after several hundred coins were minted. Among the many lepton coins that I have looked at, I have never seen two that appeared identical. The Filas coin is unique in that it is the only coin known to be in existence from that particular die. Because of minor differences due to striking variations, we know that the Filas coin is not the actual one that formed the image on the Shroud, but is a die mate of it.

The idea that one could get the match up that we have documented between the Filas coin and the right eye image by variations of the weave pattern of the fabric, or by our imaginations, or by clumping of the silver nitrate crystals in the emulsions of the photographic plates borders on the statistically preposterous. We have done control studies with other coins which some said would match as well as the Filas lepton and also with reversing the image of the Filas coin, and got typically 6 to 11 points of congruence.

### **Iconographic images**

The facial images are polytypic or complex in structure, and the forensic criteria for declaring two facial images to be the same is 45 to 60 points of congruence. The reason for the incredible detail that we see in many of the early icons and some of the Byzantine coins (which are actually numismatic icons) is that the iconographers, who were among the most skilled artists of their day, were obliged by the strict rules of iconographic images of Christ to follow the model that they had, which they called "the image not made with hands," which was felt to be an image left directly by Jesus. They were required to follow their model as accurately as possible and hence we find many apparently extraneous features in many of the icons, such as flower images and a phylactery (the box just above the nose), which could only be explained by the Shroud face being the model since the comparisons are so exacting.

Of course comparatively few of the iconographers would have direct access to the Shroud/Mandylion image itself, but would work from copies and guide books. The iconographers would pick out certain marks on the Shroud, such as the blood stains, the wounds on the cheek, the configuration of the nose, the notch in the beard, and the fold across the neck as landmarks for their productions. Thus these structures and their congruencies provide the basis for the template comparisons and documentation. The detail and the points of congruence would depend both on the skill of the artist as well as whether he was working directly from the Shroud image or from copies of varying degrees of accuracy.

The better Byzantine coins showing the head of Jesus have between 140 and 185 points of congruence, and the best icon, the Christ Pantocrator from St. Catherine's Monastery, has about 250 points of congruence. Again we have done control studies with both actual faces and various unrelated art works, and found from about 10 to 35 points of congruence to be typical, which is statistically and forensically insignificant.

## **Flowers?**

There are many other images such as the flowers and the instruments of the crucifixion of which we have large images, but without tiny details for tabulation or exacting models for comparison. We use the principles of pattern recognition with these, as statistical correlations would be rather meaningless. When one sees a pattern on the Shroud of an oval area the same size as a particular flower which has 144 tiny flowers on it, 132 of which can be counted on the Shroud, or when the image on the Shroud is the same size and configuration of the berries, leaves, stem and flowers of a particular plant, and especially when the pollens of both of these suspected plants have been independently found on the Shroud, then common sense would tend to make one think that one is probably looking at an actual flower image on the Shroud.

## **The spear used in the Crucifixion?**

Or if one sees the image on the Shroud of a staff, apparently wood, about 1¾ [?] inches in diameter and about 6 feet long, which rounds off at the upper end and has a tang 5/8 inches in diameter extending from the staff into a blade-like shape about 2 ½ inches in width at the base and narrowing to a point at about 9 inches in length, then one might make certain observations. Especially since this is very similar in size and configuration to the Roman hasta or thrusting spear, then using pattern recognition, or the principle of Occam's razor, which means giving the simplest answer that might explain one's observations, one might come to the conclusion that one is indeed likely looking at the image of a spear.

People are certainly entitled to their own opinions and interpretations, but the editor's personal view that the images of flowers, coins over the eyes, and other objects are products of our imagination has no bearing on whether the images are actually there and demonstrable. Unfortunately, such personal opinions may discourage people from seriously examining the Shroud images, and allow detractors to freely continue airing and publishing palpably nonsensical notions that the Shroud is some type of European medieval artistic production. Thus they miss much of the information on the Shroud that helps to clearly identify, date, and localize it.

Our prejudices and feelings have a great deal to do with our perceptions and interpretations. To help us overcome these limitations, we not only need to be aware of them but to use careful study, the scientific method, and peer review. Professor Danin has come from Jerusalem here to Durham, North Carolina, USA twice this year for a total of ten days to carefully study our research and findings - images, photographs, and other materials - before coming to his own conclusions. In addition, the findings on the flowers have been reviewed by at least six other Professors of Botany this year. None of them have had difficulty seeing many of the flower images.

I am not aware that the editor has seen much of this material for himself. He apparently does not realize that flower images are visible on the Shroud face image on the jacket of his book *The Mysterious Shroud*, Doubleday, 1986 (the same book was also published as

*The Evidence of the Shroud*, Michael O'Mara, London, 1986), and in the same books on the Pantocrator icon, Fig. 24, and the Byzantine solidus coin, Fig. 26. The icon and the coin are part of our work on early images and icons which were based on the Shroud images.

The flower images (and other off-the-body images) obviously were much clearer in the early years of the Shroud since they were repeatedly and rather accurately located on many of the Shroud-accurate icons, coins, and paintings from the third through the sixteenth centuries. When one knows what they are, where they are, and the characteristics of their appearance, then indeed one will become much more aware of what a remarkable and unique object the Shroud is, and the massive impact that it has had on art, religion, culture, and individuals.

I am not sure whether I am included among the editor's "woolly-headed and downright dishonest (people) promulgating information purporting to support the Shroud's authenticity which should be more of an affront than the arguments of the Shroud's honest detractors." Our basic position since the beginning of our research has been to provide the evidence of our findings as clearly as possible, with conclusions based on our data, so that people will have an opportunity to view this for themselves and to draw their own conclusions. We photograph and videotape almost all of our findings.

We recognize that there are legitimate differences of opinion. We are quite willing to learn from the thoughts and observations of others, but we give them a great deal more credence if they have actually looked at the findings. Most of the detractors of our work that I know of have not carefully examined the data. Indeed, some have refused even to look at offered information. I do not consider strong and hostile opinions and criticisms based mainly on one's prejudice and not on actual data to be a sign of honesty.

### **New Book**

There has been a major problem over many years with the hostile media in that they have often refused to air or print positive information and findings about the Shroud, while giving wide coverage to the detractors. To help make our findings available to those who wish to see them, my wife and I have written a book with sixty-five illustrations. It is entitled *Shroud of Turin An Adventure of Discovery*, and is published by Providence House Publishers [see review, p.35, Ed] . We are also putting findings on the Internet, and would refer the readers for access to these to the excellent website of Barrie Schwartz at [www.shroud.com](http://www.shroud.com).

I have appreciated the pioneering and insightful work that the editor has done over the years, and I invite him to come to Durham and look at our materials and findings for himself. While he is here, perhaps after looking through a microscope at some pollen grains from the Shroud, we might even take a few minutes to go outside to view the clouds in the beautiful North Carolina sky and see if we can spot a few whales. Alan D. Whanger, M.D. Professor Emeritus Chairman, Council for Study of the Shroud of Turin.