

CHAPTER 1

The World of Art—Modern Attempts to Replicate the Shroud

We begin our investigation with the undeniable either-or proposition posed by the Shroud. It either is the authentic burial cloth of Christ, or it is not. It is one or the other. So if it is not a genuine relic of the crucifixion, then it must be the work of an artist or someone attempting to perpetrate a fraud, either of which would be the result of human effort. As such, investigators would expect to find corresponding evidence in support of this position. Such evidence has thus far eluded discovery. We, therefore, explore the mystery from the man-made artistic approach first.

What we know is that the Shroud image is astonishingly accurate in describing the imprint of a severely scourged man with the negative image offering far more intricate detail than what is seen with the naked eye, a reversal of anything rationally understood in the artistic realm. Skeptics are happy to dismiss the Shroud as the work of a medieval artist without knowing the identity of that person or how he/she accomplished such a masterpiece. Attempts to identify a specific medieval artist with the capability of creating such an image have devolved into the world of pseudohistory and lack desired credibility.

The Shroud of Turin Research Project (STURP) arrived in Italy with over seventy crates of scientific gear weighing almost ten tons, brought from a dozen different laboratories in the US, including

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Sandia Labs and Los Alamos National Laboratory. As noted earlier, the scientific investigation was not designed to prove the Shroud as authentic but rather to discern the cause of the image and corresponding bloodstains. To recap the team's primary conclusions: there are no artistic substances on the cloth that can account for the image, and the blood tested positive for being actual blood. It is not paint.

The study did reveal that there are random particles of various substances on the cloth, including paint. However, these particles are not concentrated in the image areas and, therefore, do not account for the image. Over the centuries, the Shroud was exposed to the open air hundreds of times for various exhibitions, as well as being displayed inside the Cathedral of St. John the Baptist in Turin. The natural deterioration of the painted murals that grace the walls and ceiling would have allowed microscopic paint particles to drift onto the cloth.

In addition, there were over fifty known painted copies of the Shroud created over the course of three centuries beginning in the early 1500s. The bishop of Turin pressed these sanctioned copies to the original Shroud to elevate their relic status, greatly enhancing their value.¹ It has been demonstrated experimentally that pressing a typical oil-based painting to a clean white linen will cause particles of paint to transfer onto the cloth. This would account for the discovery of random particles of paint and other substances found during the team examination.²

Declaring the Shroud to be a medieval artwork supposes an artist or forger with an extraordinary amount of knowledge to "get it right." To begin, there are two distinct elements visible on the cloth. The first is the faint front and back image of a crucified man. The second, separate from the image of the man, is a complete pattern of bloodstains, including punctures around the head, a wound in the wrist, a gash in the side, piercings in the feet, and over 120 scourge marks impacting the body from the neck to the ankles.

The blood marks and body image have another marked dissimilarity. The blood soaks all the way through the cloth, whereas the image is purely superficial and does not penetrate beyond 1 to 2 percent of a single thread.

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A further complication for an artist/forgery is that there is no image found under the blood. This would require the application of all the blood spatters and other wounds *before* the image was created.

Artistic styles. One way of exploring the Shroud as a man-made artistic endeavor attributable to a specific artist would be to examine the artistic style. Every artist has a characteristic method that is unique and distinctive enough for an art expert to recognize and identify.

A good example known by almost anyone would be the *Mona Lisa*, painted by Leonardo da Vinci. A self-portrait of Picasso would be hard to miss. Others are also easily discernable, such as Claude Monet, Salvador Dali, or Vincent Van Gogh. The great Renaissance painters can also be identified, such as Michelangelo, Raphael, Donatello, and Botticelli. Every artist has a predictable style and technique, and the same holds true for lesser-known artists.

From this standpoint, the “style” of the Shroud is unequaled; there is nothing comparable. It stands alone throughout art history, making it exceedingly difficult to claim an artistic origin. Who was the artist? What technique did he use? What substances did he apply? All three questions remain unanswered.

What is seen on the Shroud beyond the image and blood? The closer one gets to the Shroud, the less detail one can see, which is the opposite of conventional art. In fact, if you get closer than six feet, the image seems to disappear. This phenomenon would pose a daunting challenge for any artist at any time.

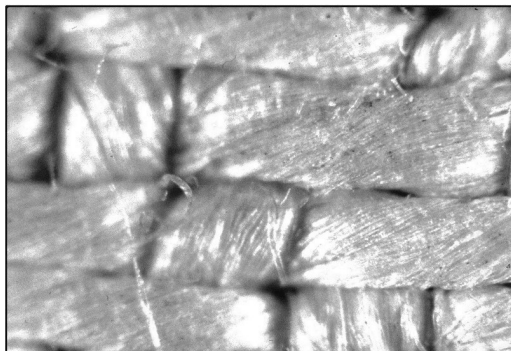
The most prominent feature on the Shroud is a pattern of burns and patches from a fire in 1532. As the Shroud was locked away behind bars for security in a chapel in Chambéry, France, the structure caught fire and became an inferno. Many experts suspect arson. It was late at night, and the clerics could not find the keys needed to open the steel cage where the Shroud lay folded in a silver reliquary, the ornate container made specifically for the sacred linen. By the time the reliquary was retrieved, the top of the box had melted; and a glob of molten silver had fallen onto a corner of the cloth, burning all the way through the many folds, creating a distinctive repetitive pat-

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tern. Doused with water, the cloth was saved, but significant damage had occurred. (See “Essential Images.”)

To look at the Shroud today, the first thing one notices is this pattern of burns and scorch marks that appear in parallel lines. Amazingly, or perhaps miraculously, the image itself was untouched except around the shoulders and elbows. A pattern of water stains is also clear. If the cloth is flipped over, one would see the burns penetrating the cloth along with the water and bloodstains that both soaked through the fabric. However, you would not see the image of the man.

The image on the Shroud, as touched on earlier, is purely a superficial phenomenon affecting only the top one to two microfibers of the linen—not threads, but microfibers. Each thread comprises about two hundred microfibers. Therefore, whatever caused the image only affects about 1 percent of a single thread, another enormous hurdle for our judicious medieval artist to negotiate. Not only did he have to paint the blood first and the image afterward, but he would also have to invent a new image process for this singular work that remains a mystery to modern science.



Shroud image close-up showing
no artistic substances

(Image courtesy of Barrie M.
Schwartz collection, STERA Inc.)

Another important detail is that the intensity of the monochrome image is uniform over the entire cloth. There is no difference in color or density whether you are looking at the dorsal or frontal image. Normally we would expect any image derived from artistic substances to show variations where some paint or pigment penetrated deeper into the fibers of one area and less in another area. That is not what is observed on the Shroud.³

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Under the microscope. There are no substances on the cloth to account for the image. Where the image appears darker, it is simply due to a greater number of microfibers affected by whatever caused the image. Where it is lighter, there are fewer microfibers affected. The microfibers act like pixels. One can view this effect by increasing or decreasing the image dpi on a computer.



Portrait painting and facial close-up
by artist Tai-Shan Schierenberg
(Image courtesy of artist)

Unlike the Shroud, the closer one gets to a painting, the more detail can be seen. If one were to view with 10X magnification on a typical artwork, the brushstrokes, the various

colors, and different densities of the paint or any other artistic substance would be easily discernable. There would be no question that you were looking at a painting.

Yet if one examines a 40X close-up image area on the Shroud from the tip of the nose, one of the darkest parts of the image, there is little to see except a slight discoloration of the weave. It is as if nothing is on the cloth.

One would have to zoom in at several hundred times magnification to see the individually affected fibers. One can easily detect a painting of any kind with visual observation or, at most, a magnifying glass; yet it requires a microscope to see anything on the Shroud.

No image deterioration. Another interesting observation comes from analyzing old paintings that haven't been in pristine settings. Paint eventually flakes off the canvas over time, leaving a bare spot in the picture. Similarly, unattended murals in aging churches through-

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out Europe show this same effect. The image no longer exists where the paint has fallen away.

But this phenomenon has not happened with the Shroud. Keepers of the linen folded and rolled it hundreds of times over the centuries, yet there is no part over the entire image where anything has flaked off. This would be impossible if the image had been crafted with paint or pigment. Constant rolling and folding would have resulted in image disintegration. In addition, the superficial nature of the image shows no evidence of dye, ink, or stain. The image does not soak through the cloth, as does the blood, and there is no indication of capillary action from the application of liquids, further validating the absence of all known artistic substances.⁴

The first photograph. The Shroud was photographed for the first time in 1898. Secondo Pia, a lawyer and amateur photographer, with permission from the Turin authorities, photographed the cloth on the last day of a short nine-day exhibition held that same year. Using a large box camera, he made his first attempt, which failed to produce a satisfactory image. His second attempt, two days later, produced two images. The first used a fourteen-minute exposure and the second a twenty-minute exposure.

Back in his Turin apartment, he placed the photographic plate in a tray filled with developer solution. The plate was huge by today's standards, over twelve inches square. A few minutes passed as Pia waited for the chemicals to work their magic, and he then pulled the plate from the tray. What he saw in that moment stunned him so deeply he almost fell out the window of his apartment. For the first time, as he observed the now-famous photonegative image of the face, Secondo thought he was seeing the face of God.⁵

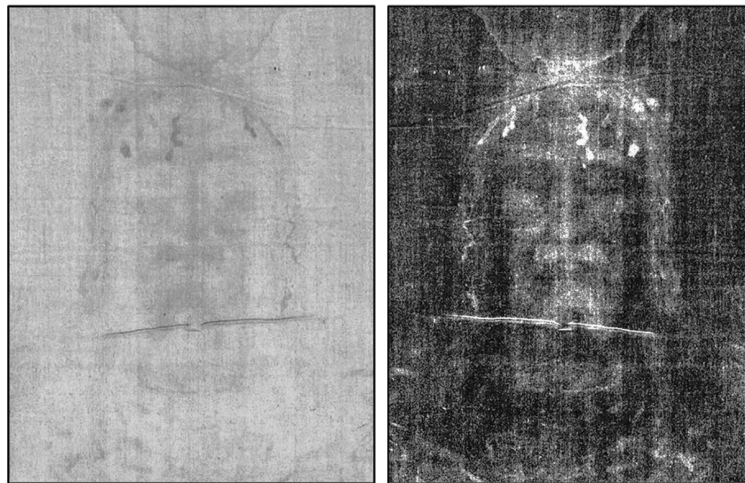
Sadly, members of academia, including the French Academy of Sciences, accused him of perpetrating a hoax. They assumed he had somehow manipulated the camera to create the effect. Few believed or accepted his discovery, and it was labeled photographic chicanery. It was not until 1931, at the end of a twenty-day exhibition, that a professional photographer named Giuseppe Enrie photographed the cloth again using far-better equipment and film, confirming Pia's

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discovery. Shroud images soon circulated the world through books, magazines, and newspapers.

The photo negative. Why does the Shroud image appear so much clearer and lifelike and with so much more detail in a negative? A typical photo negative shows very little detail. The only explanation appears to be that the image on the cloth itself must be a negative image to start with. Therefore, what one observes in the photonegative of the Shroud is really a positive image. In fact, it was the discovery of the negative image that captured the interest of the scientific community and launched the Shroud to worldwide prominence.

This observation touches on the bizarre because it is so contrary to human understanding, but it is difficult to refute. This one fact basically eliminates the Shroud as the deliberate work of a medieval artist or a forger attempting to perpetrate a hoax. The invention of photography occurred in 1830, almost five hundred years after the Shroud's documented arrival in Lirey, France.



Natural image and photonegative image of the face.
Note the unexpected detail of the negative image. (Image courtesy of Barrie M. Schwartz collection, STERA Inc.)

The photonegative image is so significant that in 2012, a prominent British art historian, Thomas de Wesselow, published an

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important book, *The Sign*, which stated unequivocally that the negative image prevents it from having come from the mind of a medieval master, no matter how skilled he may have been, because the concept would have never entered his imagination.⁶

Noted skeptics acknowledge the uniqueness of the positive/negative phenomenon with the Shroud image but skirt the issue or dismiss it as merely an accident. They suggest the ghostly image we see on the cloth in natural color was intentional while the superb photonegative image discovered in 1898 was an unintentional by-product. This skeptical response lacks any evidential credibility and, to be frank, given the massive scientific evidence to the contrary, seems flippant and insincere. No known negative of any painting or drawing has ever been produced that satisfies all the known attributes of the image and corresponding bloodstains. Imagine the scenario of a medieval artist painting blood on a linen canvas, and then overlaying it with a blurry monochrome image that is barely discernable from arm's length. Furthermore, this strange new process would not be revealed until five hundred years later after the invention of photography. One's mind must certainly stretch to fit around this story.

Modern attempts to replicate an artistic process. There have been several attempts at duplication over the past fifty years by various skeptics that range from paintings to rubbings and body imprints designed to show how an alleged medieval artist fabricated the image. Not one has yet been able to fully replicate the shroud image along with the corresponding bloodstains. By way of example, I've chosen a small but representative cross-section of theories and hands-on experiments undertaken over the years. The difficulties become apparent rather quickly; however, these efforts also show the strong desire to refute the Shroud as merely a fake. The final illustration even comes from a scientist.

Charles Freeman. One of the more recent theories popularized by British scholar Charles Freeman is that the Shroud was an "Easter prop" created in the 1300s. It allegedly began as a painted image; but after many centuries, all the paint flaked off, leaving only a "shadow," an astonishing photonegative image that was just an accidental by-product.

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The theory proposes that the artist originally mounted the cloth to a wallboard and then covered it in gesso, a chalklike substance that would absorb the paint and prevent it from soaking through the cloth.⁷ However, if the gesso would prevent the paint from soaking through, why did it not prevent the blood from soaking through?

Freeman's answer is that the artist must have added the blood later, after time had flaked off all the gesso.⁸ How convenient. The problem with this simplistic answer is the blood was on the cloth first, not years later.

Freeman derives his gesso theory from the presence of calcium carbonate on the cloth, the primary ingredient of gesso; however, true Italian gesso is also composed of glue and white paint, neither of which are found on the cloth. Calcium carbonate is, however, an element of limestone, along with varying amounts of magnesium. This substance is found on the Shroud and is consistent with a cloth being laid down in a Jerusalem tomb carved out of limestone. Freeman discounts this explanation.⁹

Luigi Garlaschelli. Professor Garlaschelli, a prominent Italian skeptic, wrapped a long rectangular cloth over one of his students and painted the outside with red ochre pigment mixed with solid acid and salt. He captured only the prominent features such as the elbows, hands, knees, and upper parts of the legs and arms. He filled in the rest of the image freehand after removing the cloth from the student's body and used a bas-relief sculpture for the face to protect the student from chemicals. The experiment failed as the acids did not discolor the fibers without adding water.

Garlaschelli then tried a second experiment using 1.2 percent sulfuric acid mixed with a blue pigment to result in a semifluid paste and applied it to the sheet in the same way. It was then heated to 140 degrees centigrade (284 degrees Fahrenheit) for three hours to simulate aging. Next they washed it, removing all the blue pigment, revealing an image from the effect of diluted acid, not from the pigment. While this may be better than many attempts to replicate the image, it still falls short in many areas.

In their experiment, the pigment remained on the cloth while artificially aged in the oven. This does not simulate reality. If this

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process was the actual cause of the image, the pigment would have flaked off unevenly over the years as the cloth was rolled and folded hundreds of times for public or private exhibitions. Real aging, as opposed to simulated aging, would cause the image to appear uneven or blotchy as the paint gradually flaked off. It also assumes there would be no trace of the original pigment remaining on the cloth detectable today.

The Shroud image is nuanced in that it gently fades at the edges whereas Garlaschelli's image has sharper edges and clearer outlines. At points where the cloth copy was not in contact with the volunteer's body, there is no image. However, with the Shroud, there are image areas that appear lighter but would not have been in contact with the body. Areas closer to the body appear darker as more microfibers are affected by whatever caused the image. Garlaschelli's attempt is clearly a contact image.

Lastly he made the mistake every Shroud fabricator makes. He painted the "blood" on the cloth after the image was baked onto it. Not so with the Shroud. The bloodstains were on the cloth before the image was created. The blood is a contact process; the image is not.¹⁰

Nicholas Allen. Nicholas Allen made a splash in the late 1990s with the announcement of his "protophotography" theory that proposes a

medieval photographer created a light sensitive emulsion, coated it onto linen cloth and "exposed" this medieval "film" using a room sized camera obscura and a dead body hanging in front of its crystal lens as the subject matter.¹¹

As gruesome as this sounds, it gets worse. He proposed the alleged artist took this dead body and exposed one-half of the cloth at a time—four days for the frontal image and four more days for the dorsal image over eight days and a separate exposure for the face with a more focused lens. The body would also need to be in the

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bright sun over the course of eight days to project the image onto the cloth.¹²

A gas mask and a gallon of insecticide might have been useful here for Mr. Allen. Obviously, Allen was unaware of the rapid changes that occur as a body decomposes. The first stage is *autolysis* or self-digestion and occurs within hours of death as the body becomes completely rigid from rigor mortis. Stage two is *bloat*. The body can expand to almost twice its normal size from gases released as the body decays. An intense stench surrounds the body as insects and microorganisms move in. Stage three is *active decay*, when fluids release through orifices as organs, muscles, and skin become liquefied. All three phases of decay would occur within the first eight to ten days.¹³ Amazingly, none of these stages of decay were “projected” onto the linen. The theory is simply preposterous.

Leonardo da Vinci. And then there is the most far-fetched artistic theory of them all—that the image was crafted by Leonardo da Vinci. The proponents of this theory start with the premise that the fake Shroud image could only have been crafted by someone with tremendous artistic skill, full knowledge of human anatomy, and an inventor, to boot. They credit da Vinci with devising a primitive form of photography and using a sculpture of his own face to project the image onto an ancient piece of linen. To account for the time lapse of over one hundred years after the Shroud’s arrival in Lirey, France, it is said that “da Vinci’s forgery was commissioned to replace an earlier version that was exposed as a poor fake, which had been bought by the powerful Savoy family in 1453 only to disappear for 50 years. When it returned to public view, it was hailed as a genuine relic, and experts say it was actually the artist’s convincing replica.”¹⁴

The problems with this are numerous, not least of which is that the complexity of photography was not yet invented, but there is also the well-known fact of da Vinci having kept meticulous notes on all his work, including experiments and inventions, but no citations exist that link him to the creation of the Shroud image.¹⁵ While there seem to be no limits to the absurd, this notion periodically crops up in some books or documentaries, as shown above, hence its inclusion among these purported explanations.

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Our final example is unique in that it was proposed by a scientist who associated with the STURP team, albeit somewhat briefly. Nevertheless, his direct access to Shroud samples and studies resulted in his theory enjoying quite a lot of notoriety.

Walter McCrone. The most prominent scientific skeptic was microscopist Walter McCrone, who proposed his own theory of how a medieval artist created the Shroud image. Founder of the McCrone Research Institute in Chicago, Dr. McCrone (d. 2002) was internationally known for his work in the field of microscopy, in particular as a particle expert. *The Particle Atlas* was his well-respected multivolume reference work. He also wrote his own book on the Shroud. His opinions continue to be referenced within the skeptical debate, so I offer his proposal for a painted shroud for the reader's consideration.

McCrone had known STURP lead chemist Ray Rogers for many years, and due to that relationship and his reputation, he was given samples from the Turin investigation for study. Rogers loaned him thirty-two Mylar sticky tape samples from the Shroud in late October 1978, which contained fibers, particles, and various other debris removed from multiple areas of the cloth. McCrone was confident that he could accurately identify any known particle, based on his extensive experience and what he called his "online computer," his brain.¹⁶

Using primarily polarized light microscopy, McCrone determined quite quickly that the red flakes found on multiple slides, including image areas, were iron oxide. Reporting the wide disbursement of these particles he alleged the image resulted from iron oxide suspended in a thin binder solution, creating the pigment red ochre, which he believed was undoubtedly used to paint the image. He contended that the darker "blood" areas were also red ochre with the addition of another pigment, vermilion.

To conduct his work, McCrone chose to place each of the tapes onto microscope slides and proceeded to examine them through the tape backing. To view the samples this way is somewhat ironic, as McCrone wrote in his book that Mylar tape was not such a good choice because it was optically inferior.¹⁷ In any event, one property he observed from what he identified as iron oxide, was birefringence,

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a splitting of transmitted light due to the crystalline nature of the particle. It was also this finding of birefringence that told him the flakes were not blood, which does not respond in the same way.¹⁸

In contrast to this, Dr. John Heller, working later with the same tapes as McCrone, made the opposite finding. Heller was one of the blood experts working alongside Dr. Alan Adler as members of STURP. Recognizing that the nature of the Mylar tape would distort the visualization of some particles, the two painstakingly removed the tape and all adhesive, allowing full access to the fibers. The particles did not exhibit birefringence, and when they were removed using various solvents, the red flakes dissolved, verifying the presence of blood. Blood is soluble, but iron oxide is not. Same samples; different results.

McCrone understood that the binder solution needed as a medium for red ochre pigment would have contained some form of protein commonly available to the medieval artist. McCrone surmised this came from parchment scraps (animal hide). From a variety of tests, he identified the medium as a dilute gelatin-tempera solution that allowed for the even dispersal of the pigment throughout.¹⁹

With the pigment and the medium determined he initially declared that the image was a finger painting, but later decided that it was actually painted with a brush using the dilute pigment solution. He believed the yellow-straw color of the fibers in image areas was simply the result of the aging tempera.²⁰

To verify his artistic conclusions McCrone asked an artist friend, Walter Sanford, to paint some shrouds using the dilute solution he devised of 0.01 percent red ochre in 0.01 percent gelatin solution which he proposed was employed by the unknown medieval artist. Sanford painted only the head portion and also made some using diluted blood. McCrone described how most were painted with a brush and took about thirty minutes to complete.²¹

Shroud expert Dr. Gilbert Lavoie was able to purchase one of the red ochre versions from Sanford for examination. It was quickly relegated to the long list of failed attempts. It was smudgy and clearly made with a liquid, as the paint binder solution soaked all the way through the cloth, staining both sides.²² Nowhere in McCrone's book

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does he address this common fatal problem, of the pigment soaking through the cloth, as experienced by many a would-be Shroud copyist.

McCrone's claims were scrutinized and evaluated by many of the STURP scientists, whose own investigations produced very different findings. The scientists analyzed the Shroud, both image and non-image areas, with visible and ultraviolet spectrometry, infrared spectrometry, x-ray fluorescence spectrometry, and thermography. Chemist Ray Rogers made more observations with pyrolysis mass spectrometry, laser-microprobe Raman analyses, and microchemical testing. Each chemical compound absorbs wavelengths that are characteristic of its chemical structure. No evidence for pigments was found, nor protein that would indicate a paint medium.²³ Rogers stated:

No positive tests for proteins were obtained with the reliable reagents applied to Shroud fibers from either background or pure image areas. *No proteins had been added to image areas.* The tests proved the image was not painted with an egg-tempera system, as claimed by McCrone.²⁴ (Emphasis added)

Surprisingly, with the tape samples in his possession for more than a year, McCrone himself never tested the straw-yellow fibers that make up the image for the presence of protein. A positive test would have cemented his theory. It indicates a clear lack of confidence in his own hypothesis. Instead, he lamented,

Obviously, I could not have conducted staining tests for collagen tempera (protein) on the body-image fibers after STURP had taken my tapes away from me in January 1980.²⁵

Rather than acknowledging and discussing the differing results with his colleagues, McCrone chose to go his own way, distancing

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himself from STURP. After two of his papers on his Shroud findings were reviewed and subsequently rejected by the group, he published them in his own journal, *The Microscope*, for which he was the editor.

The following quote is McCrone's personal assessment of the Shroud:

My position at this point was that the "Shroud" had been painted by an artist using a common medieval collagen tempera (watercolor) paint with red ochre pigment...I believe the "Shroud" was painted by an artist shortly before it first appeared in history in 1356, say 1355 to allow a year 'for the paint to dry.' There is no blood on the "Shroud." That was my position by January 1, 1980 and I have maintained that position at every opportunity since.²⁶

The theory put forth by McCrone has never been validated by his fellow scientists. In fact, the evidence continues to weigh against it. The main contribution he has made is to further clarify the vast difficulties encountered by those who have attempted to explain the image of the Shroud as a painting.

Beyond these examples lie many more, with all sharing the dubious distinction of failing the test. I would say the odds of finding a process or an artist capable of this creation are not looking good. Consequently, the time has come to see what the field of science has discovered.