Interview with Adam Lowe
Datareality

Adam Lowe is the founder of Factum Arte, a multidisciplinary workshop exploring the union of digital and physical artistry, and its application to the realm of conservation and preservation. Where there typically exist clear divisions between the theories of conservation, technological development of documentation systems, and the physical work performed on heritage objects, Factum Arte is unique in that it seeks to inform traditional craft skills with new technologies, and vice versa.

While the group is based in Madrid, it has worked with many world-renowned institutions, including the National Gallery, the Museo del Prado, the Louvre, The Vatican Museums, and the Fondazione Giorgio Cini. Factum Arte's internationally acclaimed preservation projects include a facsimile of Veronese's Wedding at Cana in San Giorgio Maggiore in Venice, and a facsimile of the burial chamber of the Egyptian Pharoah Tutankhamen, which was recently installed at the entrance of the Valley of the Kings. During his presentation, Lowe spoke of the challenges of executing each of these projects, from the inception of new technologies of documentation, to obsessive detailing by hand. The subjective nature of art conservation inspires Lowe's work, which he classifies as "reenactments of performances of objects." Embedded in this assessment is his belief that "works of art respect the complex and dynamic nature of material evidence, and that, in treating the object as an ever-evolving artifact, our view of how the past conditions the present is influenced." He contends that, in reading an object, we are witnessing the many layers of its past, including its conservation history, its present state, and even perhaps anticipating how the object will be interpreted in the future.

In 2006, The Fondazione Giorgio Cini commissioned Factum Arte to produce a facsimile of Veronese's sixteenth-century *Wedding at Cana*, a painting that had been conceived in collaboration with Palladio for his design of the refectory in San Giorgio Maggiore monastery, one of the great masterpieces of Renaissance architecture. The painting was looted by Napoleon's troops, and is currently on display in the Louvre. Consequently, due to this profound contextual relationship between art and architecture, the building was "rendered a shadow of its former glory."

For this project, Factum Arte designed a novel system of documentation (or in Lowe's words, "dematerialization"), consisting of a scanner structured on a pumping vertical mast, positioned 8 cm from the canvas surface. The painting was then documented using flatbed scanning, traditional photography, and 3D scanning to record texture. Lowe asserts that his workshop "does not treat paintings primarily as images, but as objects." With this data, a facsimile was then constructed using conventional conservation techniques. Lowe recounts the initial unveiling of the facsimile, and the visceral and emotional response of the public, despite awareness that the painting was a reproduction. While the canvas may not be the original, the

experience of seeing this painting in its intended site is authentic, in the sense that it adheres to the artist's and architect's intended vision.

Several years later, Factum Arte was commissioned by the Egyptian Supreme Council of Antiquity to record the burial chamber of Tutankhamen in the Valley of the Kings, and to produce a facsimile of the site in order to protect the original from devastation by excessive amounts of tourists. These tombs were never intended to be opened, and exposure to heavy foot traffic and humidity had begun to cause severe deterioration. Factum Arte began the process by documenting the environment at a resolution of 100 million points per square meter, using high-resolution photography, close range laser scanning, and white light scanning. The digital data was then taken back to the workshop in Madrid, where computer-controlled milling was used to painstakingly reconstruct the surfaces of the tomb, which was installed in January 2014 at the entrance to the Valley of the Kings. Lowe insists upon the legitimacy of facsimiles, and believes "tourists should understand that by visiting a facsimile, they can understand and experience as much as with the original, all while contributing to the overall preservation of the site."

While Lowe evidently does not believe in notions of objective originality, he claims that there is a close correspondence between the primary object and its reproduction, facilitated by an ability to capture increasingly high amounts of data. The facsimiles of Factum Arte are at such a high level of precision that they truly begin to question the relationship between original and copy, and to upend accepted notions of authenticity. Lowe argues that this is a broad phenomenon, and that attitudes towards art are shifting globally: "Over the world, the cultured classes had a notion of originality as a fixed thing, but that switch is happening. With mass tourism as it is, the relationship between originality and authenticity is the thing that's being negotiated, particularly in conservation. "

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NK: *Factum Arte* sits at the intersection of technology and craft, and you are continuously stressing the union of these two fields. Do you envision craft always playing a part in the practice of conservation, or is there a time when craft will be completely diminished?

AL: In an ideal world, all conservation would be completely objective and completely verifiably objective, but of course that's absolutely impossible. So what you see, which is a very important part of *Future Anterior's* interest, is attention paid to the biography or career of an object. When you're looking at a painting like Veronese's *The Wedding at Cana,* you're seeing in that case its history from the end of the eighteenth century to the present day. It was cut into sections and ripped off the wall and taken to Paris, and then put back together and repainted, because there was quite heavy paint loss. There was then a series of conservation attempts that went on in the Louvre that changed the painting in significant ways. That's a relatively straightforward biography. There are many other paintings that have

moved from one place to another. Recently, I was in Dresden and looking at the collection there. It was fascinating because I'm much less familiar with German restoration styles. You can start to see different approaches to different paintings in different places, and you can watch how their career changes or alters depending on where they've been, how they've been valued, what qualities have been prioritized, and what have been suppressed. I think one of the roles that technology has to play is in helping us unravel and understand better the career of each of these objects. And as we understand the way they've changed, we also can see the people who've changed them, so you see the different values in different places at different times being projected upon one ideal form. There will always be a need for building bridges between technical skills and manual skills in the way we document. It's a myth to believe that anything is documented objectively. Different photographers would light the same sculpture in different ways, and that would be a different style. *Factum Arte* has its own procedures which constitute a style as well, one that is completely different from other people. And yes, it's subtle, but there are different styles. In all restoration conservation, the current generation of conservators is always critical of the actions of the previous generation. That in and of itself demonstrates the subjectivity of the treatment. As new methods come along and are adopted, they become flavor of the month until someone else raises issue with what's being done. Paraloid was the great savior of restoration and now it's banned, or frowned upon in most museums.

NK: Where do you see subjectivity arising in your work with *Factum Arte?*

AL: Well there's subjectivity on every level, but we try and minimize it. For example, even in the design and building of the laser scanner, and the writing of the software, there's a great amount of character, rather than subjectivity. The subjectivity is always put in opposition to some notion of objectivity, but I prefer to think of all the instruments we use as having their character, and the character is very much the result of the dominant designer. In the case of our Lucida Scanner, it's the character of Manuel Franquelo, who conceived it, and has built an absolutely beautiful scanning system that has extraordinary advantages, and has solved many problems in terms of the documentation of surface of objects. I think there is objectivity and character at every level, and obviously who writes the software controls the way some things are formed. The way the machine is optimized determines its character. How we merge and stitch the data introduces another character. It's basically a series of mediations, and what you need to do is to understand the transformations that happen at any mediation. Then you can see where the objectivity might lie.

NK: Can you highlight a certain example where that character in building the machine really dramatically affected the end product of *Factum's* work?

AL: Yes. So for example, most scanning systems are effectively abstracting their data as they go along. They're turning a world out there with a surface into a cloud of points in three-dimensional space. The Lucida scanner does that, but it also captures the data as a greyscale TIFF file. Rather than abstracting the object, it's condensing

it. So in the future, when there's more computational power, or more ability to process the data at higher resolutions, we'll be able to treat that greyscale data very differently from the way a point cloud can be treated today. Other than interpolating between the points, which is giving you an average, the greyscale data will actually be able to be processed at higher resolutions in the future. That's a very good example of the character. Another example is in how the scanner works, by finding a mathematical center to a laser line using a number of mathematical programs and computations. We've been able to re-focus the laser so it's finer and can find its mathematical center more easily. We've also put a lot of work in understanding how speckled noise (what exists in the space between the eyes of the camera and the surfaces of the object, interaction to the laser light) can give us better and more pure data from very diverse surfaces.

NK: So you talked a little bit about precision in your presentation. Could you elaborate on how you determine your level of precision, or what's the threshold for your documentation of objects?

AL: 3D scanning, like 3D printing in a way, is a relatively new topic. We're constantly trying to clarify exactly which bits of data, statements, or which commercial assertions are true, and which aren't. I fully understand that anyone designing a scanner wants to communicate to the biggest audience, but very often, the machine can't perform according to its specifications. Our interest is in scanners that can deliver data that has a close correspondence to the surface that's being recorded. I think that's a slightly different approach from many technologically driven or metrologically driven systems. I wouldn't ever claim that our Lucida scanner is the greatest measuring device. If I was trying to measure from one point to another, it probably couldn't perform this as well as many other devices or point measuring systems. But what I would claim, from all the evidence, is that the data recorded with the Lucida of the surface of paintings has a much closer correspondence than any other data set you've ever seen.

NK: Do you see these tools as eventually being universalized and distributed, or accessible to people with less technological backgrounds?

AL: The Lucida scanner is very easy to use. It's been designed to be that. Because really what we want is an operator in Egypt with a relatively good knowledge of computer skills and a reasonable knowledge of photography to be able to operate it very quickly, and to be able to do basic troubleshooting. Again, one of the reasons we moved away from high resolution point clouds to tonal data is that we can handle the data with normal image viewing software rather than expensive 3D software. So certainly I would hope that in ten years' time all the major museums are scanning the surfaces of their artwork before restoration. Apart from anything else, the most important thing that we're trying to do is provide the data to monitor the condition of objects. Facsimiles sometimes have an application— in the case of Tutankhamen's Tomb, or in the case of Veronese, there are applications for the re-materialization of the data. But much more important than that are the archives

where you can bring together many different types of data in the same place, facilitating a new study and understanding of the object.

NK: Do you think that the spread of these innovative technologies will draw people from outside of the field, bringing more interest to preservation itself?

AL: Yes, I think that's happening. For example, with our facsimile of Tutankhamen's Tomb, people are looking at an object that makes them wonder, "Wow, how did they do that?" To me, it's staggeringly important that people who know their history, know their painting, who know their spaces & architecture, could have an emotional and visceral response to a work they understand to be a copy. This certainly suggests that there's a lot of work that needs to be done on understanding the relationship between a copy and an original artwork.

NK: You mentioned in your talk that, when you work, you would like to be able to replicate the experience of all five senses. Could you speak a little bit more about this?

AL: That's what we're working on. Old facsimiles of paintings were either painted by hand, which are inherently subjective in lots of ways, or they have false texture. In the 70's, there was an attempt to print paintings on canvas, and to add in **pastate SP** paste. But that looks very fake, and it looks wrong. If you can really merge surface, color, tone, and density, you can get somewhere towards making an object that, from a normal viewing distance, looks like the original object. Our interest is really in going further than that. If you can go into a facsimile of the tomb and it smells the same, the acoustics are the same, the touch is the same, and the temperature is the same, you can start playing with the synesthetic nature of our response to digital information, where the experience becomes completely multisensory. One of the projects we completed was for the Hereford Cathedral, in which we scanned the surface of the Mappa Mundi, which was painted on a single large cowskin in about 1300. The vellum over time has holes, scratches, and undulations, and has been repaired numerous times. We managed to make a landscape out of the surface of the map, where each of the letters that are painted in black or gold is actually in slight relief. By exaggerating the relief, we were able to make a landscape surface that the blind can touch. But also, it enables you to see the map in a very fresh way, because when the surface is made physical and separated from the color, it makes you thing about many different things, but particularly the relationship between the vellum itself and what's drawn on it.

NK: Thinking about the work you've done on tombs in Egypt, it raised questions for me about cultural imperialism, professionals from the West going into other countries and determining the work that's done on that country's cultural objects. What agency do we have to record or reproduce these works?

AL: It's very important to understand that our work has absolutely nothing to do with cultural imperialism. We're working for the Supreme Council of Antiquity, who

are the Egyptian owners, and have worked under three different governments. We're making a transfer of all the skills and the technologies, so that the majority of the work may be carried out by local Egyptian operators. Our project is therefore generating employment on a number of different levels in the area.

In a way, the Theban Acropolis is located in Egypt, but is of supreme importance to the world. The most important heritage sites transcend national boundaries, so the preservation of cultural heritage should, in an ideal world, not be limited by the national boundaries within which it falls. So many of the countries now with some of the greatest heritage have limited means to protect them. I think that heritage objects can be at risk either from vast tourist numbers, or from war and conflict. My sense is that the world needs to work together. So in this case it's absolutely non-imperialist.

What we're trying to do is aid the people whose responsibility it is to protect and document the object, to create a time slice documentation of the object. In 2007- that's what the Veronese looked like. In 2009—that's exactly what the surface of Tutankhamen's tomb was. And for me that data is critical to monitor it. But it's also desperately important that the custodian, in this case the Supreme Council, is the person that benefits if any money is to be made from that data. Either with current uses or with future applications.

One of the issues at the moment is that technology is changing so fast that we often don't know how the money will be derived from it in the future. It's desperately important that cultural institutions, whether it's the Louvre or the National Gallery or the Supreme Council, retain all the copyright to the data that's been recorded, and that we use the money derived from it to ensure that conservation can be carried out on other sites and other works of art. There are ways of generating significant revenue from cultural heritage for the purpose of its own preservation, especially with a growing tourist world. But it's desperately important that money stays in the loop and doesn't just get taken out by governments and applied to different things.

NK: In other words, when you do a project, you're not focused solely on the recording ad storing of data, but you're also seeking to leave the skills that you used behind.

AL: Right, so in Egypt, by the time we leave, they will have a group of fully trained scanner operators, being able to work in laser scanners and white light scanners. They'll have photographic operators being able to carry out panoramic photography. Our interest is, without a doubt, to leave trained teams able to document objects. But equally, it's to build the facsimile workshops. Also, I think the response we've had leads me to believe that the visitors are really ready, and they want to become part of a force that's willing to protect these sites, rather than to think about themselves as a destructive force. And I think what we're finding is there's a real shift in attitude, rather like what I think happened with the great movement of the planet, where there's a real awareness that unless we change our

attitudes, humanity can be a profoundly destructive force. And in exactly the same way, I think mass tourism is putting a kind of pressure on our heritage objects, whether it's the Sistine Chapel or the Natonal Gallery in London or the Louvre, nothing can take that many visitors. You can arrest it, you can create some degree of stability, but that number of people needs to decrease. And that's just the nature of the problem

So what happened just a few years ago in 2012, is that the BBC published a short piece about what we were doing in the Valley of the Kings. A couple Australian tourists were saying "we'd never travel here to see a fake," but two years later, you get a real awareness with people saying "I never knew we were doing that much damage." So that's the first part, is actually getting people to understand why a dynamic environment in a tomb is problematic for its long term survival. So why, when the tombs are sealed and the temperature stays constant and the humidity stays constant, there's no movement of air and everything's static, everything will remain for a long time. But the minute you have the tmepeature and humidity fluctuating, and dust, you get an environment where something's breaking down.

NK: So you see your work almost as protective of the original artifact in some ways?

AL: I think the whole motivation for what we're doing is to ensure that, whatever happens to the original artifact, there is the data of how it looked in time. We've got a very beautiful project at the moment with the National Gallery in London, where we're recording a painting by Bellini before the restoration starts, during the restoration, and at the end of the restoration, so that you'll be able to compare the changes to the surface of the paint and to the surface of the panel at different times during the restoration. And you'll be able to compare how it looked before the restoration began and after the restoration finished. Very much I see the work we're doing going absolutely hand-in-hand with the work being carried out by traditional conservation and restoration departments. These two things are simply not in opposition. It's not either hands-off restoring or hands-on restoring, it's about using all the tools at our disposal to actually understand the things we're trying to care for better.

NK: As I final question, I'd like to ask where do you see the practice of historic preservation going in the next 50 years?

AL: I think the use of technology to document will lead the way in almost every front. I hope that a new school of digital restoration will proceed and any actual restoration process. If we can try out certain hypotheses on the high resolution data, and start to have discussions about the aesthetics of conservation, then I think we'll be in very exciting territory.