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▶ **To cite this version:**

Bruno Latour, Adam Lowe. The Migration of the Aura Exploring the Original Through Its Fac similes. Thoma Bartscherer; Roderick Coover. Switching Codes Thinking Through Digital Technology in the Humanities and the Arts, University of Chicago Press, pp.275 - 297, 2011, 9780226038315. hal-02057253

HAL Id: hal-02057253

https://sciencespo.hal.science/hal-02057253

Submitted on 5 Mar 2019

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The migration of the aura or how to explore the original through its fac similes*

A chapter prepared by Bruno Latour & Adam Lowe
for Thomas Bartscherer (editor) **Switching Codes,** *University of Chicago Press (2010)*
Final version –after editing by CUP

To Pasquale Gagliardi

* We thank the participants at the dialog held in Venice in San Giorgio on "Inheriting the Past" for many useful conversatins and especially the director of the Cini Foundation, Pasquale Gagliardi.

Something odd has happened to Holbein's *Ambassadors* at the National Gallery in London. The visitor does not immediately know how to describe her malaise. The painting is completely flat; its colors bright but somewhat garish; the shape of every object is still there but slightly exaggerated; she wonders what has happened to this favorite painting of hers. "That's it," she mutters, "The painting has lost its depth; the fluid dynamics of the paint has gone. It is just a surface now." But, what does this surface look like? The visitor looks around, puzzled, and, then, the answer dawns on her: it resembles almost exactly the poster she bought several years ago at the Gallery bookshop, and that still hangs in her study at home. Only the dimension differs.

Could it be true? She wonders. Could they have *replaced* the *Ambassadors* by a fac simile? Maybe it's on loan to some other museums, and, so as to not disappoint the visitors, they put up with this copy. Or maybe they did not want to trick us, and it is a projection. It is so flat and bright that it could almost be a slide projected on a screen… Fortunately, she composes herself enough to not ask the stern guard in the room whether this most famous painting is the original or not. What a shock it would have been. Unfortunately, she knows enough about the strange customs of restorers and curators to bow to the fact that this is, indeed, the original although only in name, that the real original has been irreversibly lost and that it has been substituted by what most people like in a copy: bright colors, shining surface, and above all a perfect *resemblance* with the slides sold at the bookshop that are shown in art classes all over the world by art teachers most often interested only in the shape and theme of a painting but not by any other marks registered in the thick surface of a work. She leaves the room suppressing a tear: the original has been turned into a *copy of itself looking like a cheap copy*, and no one seems to complain, or even to notice, the substitution. They seem happy to have visited in London the original poster of Holbein's *Ambassadors*!

Something even stranger happened to her, some time later, in the Salle de *la Joconde* in Le Louvre. To finally get at this cult icon of the Da Vinci code, hundreds of thousands of visitors have to enter through two doors that are separated by a huge framed painting, Veronese's *Nozze di Cana*, a rather dark giant of a piece that directly faces the tiny *Mona Lisa,* barely visible through her thick anti-fanatic glass. Now the visitor is really stunned. In the Hollywood machinery of the miraculous wedding, she no longer recognizes the *fac simile* that she had the good fortune of seeing at the end of 2007 when she was invited by the Fondazione Cini to the island of San Giorgio, in Venice. There it was, she remembers vividly, a painting on canvas, so thick and deep that you could still see the brush marks of Veronese and feel the sharp cuts that Napoleon's orderlies had to make in order to tear the painting from the wall, strip by strip, before rolling it like a carpet and sending it as a war booty to Paris in 1797 — a cultural rape very much in the mind of all Venetians, up to this day. But there, in Palladio's refectory, the painting (yes, it was a painting even though it was produced through the intermediary of digital techniques) had an altogether different meaning: it was mounted at a different height, one that makes sense in a dining room; it was delicately lit by the natural light of huge East and West windows so that at about 5pm on a summer afternoon the light in the room exactly coincides with the light

in the painting; it had, of course, no frame; and, more importantly, Palladio's architecture merged with admirable continuity within Veronese's painted architecture giving this refectory of the Benedictine monks such a *trompe l'oeil* depth of vision that you could not stop yourself from walking slowly back and forth and up and down the room to enter deeper and deeper into the mystery of the miracle [see the photo essay].

But here, in the *Mona Lisa* room, even though every part of the painting looked just the same (as far as she could remember), the meaning of the painting she had seen in Venice seemed entirely lost. Why does it have such a huge gilt frame? Why are there doors on both sides? Why is it hanging so low, making a mockery of the Venetian balcony on which the guests were crowding ? The bride and groom, squashed into the left hand corner, seemed peripheral here, while in Venice, they were of great importance, articulating a scene of sexual intrigue that felt like a still from a film. In Paris, the composition made less sense. Why this ugly zenithal light? Why this air conditioned room with its dung brown polished plaster walls? In Venice, there was no air-conditioning; the painting was allowed to breathe by itself as if Veronese had just left it to dry. And, anyway, the visitors could not move around the painting to ponder those questions without bumping into others momentarily glued (queued) to the *Joconde* turning their backs to the Veronese.

A terrible cognitive dissonance. And yet there was no doubt that this one, in Paris, was the original; no substitution had occurred, no cheating of any sort -- with all its restoration Veronese would certainly be surprised to see the painting looking as it does, but that's different from cheating. She remembered perfectly well that in Venice it was clearly written: "A facsimile". And in San Giorgio there was even a small exhibition to explain in some detail the complex digital processes that Factum Arte, the workshop in Madrid, had used to de- then re-materialize the gigantic Parisian painting, carefully laser scanning it, A4 by A4, photographing it in similarly sized sections, white light scanning it to record the relief surface, and then somehow managing to stitch together the digital files before instructing a purpose-built printer to deposit pigments onto a canvas carefully coated with a gesso almost identical to that used by Veronese. Is it possible that the Venice version, although it clearly states that it is a facsimile, is actually *more original* than the Paris original, she wonders? She now remembers that on the phone with a French art historian friend, she had been castigated for spending so much time in San Giorgio with the copy of the *Nozze*: "Why waste your time with a fake Veronese, when there are so many true ones in Venice?!" her friend had said, to which she had replied, without realizing what she was saying: "But come here *to see it for yourself,* no description can replace seeing this original… oops, I mean, is this not the very definition of 'aura'?…". Without question, for her, the aura of the original had *migrated* from Le Louvre to San Giorgio: the best proof was that you had to come to the original and see it. What a dramatic contrast, she thought, between the Veronese and the *Ambassadors, which* claims to be the original in order to hide the fact that it is an expensive copy of one of its cheap copies!

"But it's not the original, it's just a facsimile!" How often have we heard such a retort when confronted with an otherwise perfect reproduction of a painting? No question about it, the obsession of the age is for the original version. Only the original possesses an aura, this mysterious and mystical quality that no second hand version will ever get. But paradoxically, this obsession for pinpointing originality increases proportionally with the availability and accessibility of more and more copies of better and better quality. If so much energy is devoted to the search for the original — for archeological and marketing reasons— it is because the possibility of making copies has never been so open-ended. If no copies of the *Mona Lisa* existed would we pursue it with such energy — and, would we devise so many conspiracy theories to decide whether or not the version held under glass and protected by sophisticated alarms is the original surface painted by Leonardo's hand or not. In other words, the intensity of the search for the original depends on the amount of passion and the number of interests triggered by its copies. No copies, no original. In order to stamp a piece with the mark of originality, you need to apply to its surface the huge pressure that only a great number of reproductions can provide.

So, in spite of the knee-jerk reaction —"But this is just a facsimile"—, we should refuse to decide too quickly when considering the value of either the original or its reproduction. Thus, the real phenomenon to be accounted for is not the punctual delineation of one version divorced from the rest of its copies, but the whole assemblage made up of one —or several— original(s) *together with* the retinue of its continually re-written biography. It is not a case of "either or" but of "and, and". Is it not because the Nile ends up in such a huge delta that the century-old search for its sources had been so thrilling? To pursue the metaphor, we want, in this paper, to behave like hydrographers intent in deploying the whole catchment area of a river, not only focusing on an original spring. A given work of art should be compared not to any isolated locus but to a river's catchment, complete with its estuaries, its many tributaries, its dramatic rapids, its many meandering turns and, of course, also, its several hidden sources.

To give a name to this catchment area, we will use the word *trajectory*. A work of art —no matter of which material it is made — has a trajectory or, to use another expression popularized by anthropologists, a career.[1] What we want to do in this paper is to specify the trajectory or career of a work of art and to move from one question that we find moot ("Is it an original or merely a copy?") to another one that we take to be decisive, especially at the time of digital reproduction: "Is it *well* or *badly* reproduced?" The reason why we find this second question so important is because the quality, conservation, continuation, sustenance and appropriation of the original depends entirely on the distinction between good and bad reproduction. We want to argue that a badly reproduced original risks disappearing while a well accounted for original may continue to enhance its originality *and* to trigger new copies. This is why we want to show that

[1] Appadurai, Arjun, ed. *The Social Life of Things. Commodities in Cultural Perspective*. Cambridge: Cambridge University Press, 1986; Tamen, Miguel. *Friends of Interpretable Objects*. Cambridge, Mass: Harvard University Press, 2001.

facsimiles, especially those relying on complex (digital) techniques, are the most fruitful way to explore the original and even to help re-define what originality actually is.

To shift the attention of the reader away from the detection of the original to that of the quality of its reproduction, let us remember that the word "copy" does not need to be so derogatory, since it comes from the same etymology as "copious," and thus designates a source of *abundance*. There is nothing inferior in the notion of a copy, simply a proof of fecundity. Is originality something that is fecund enough to produce an abundance of copies? So much so that, in order to give a first shape to the abstract notion of the trajectory, we wish to call upon the antique emblem of a *cornucopia*: a twisted goat horn with a sharp end —the original— and a wide mouth disgorging at will an endless flow of riches (all thanks to Zeus). Actually, this connection between the idea of copies and that of the original should come as no surprise, since for a work of art to be original means nothing but to be the *origin* of a long lineage. Something which has no progeny, no reproduction, and no inheritors is not called original but rather sterile or barren. To the question: "Is this isolated piece an original or a facsimile?," it might be more interesting to ask: "Is this segment in the trajectory of the work of art barren or fertile?".

To say that a work of art grows in originality thanks to the quality and abundance of its copies, is nothing odd: this is true of the trajectory of any set of interpretations. If the songs of the *Iliad* had remained stuck in one little village of Asia Minor, Homer would not be considered as a (collective) author of such great originality. It is *because* —and not in spite—of the thousands and thousands of repetitions and variations of the songs that, when considering any copy of the *Iliad*, we are moved so much by the *unlimited* fecundity of the original. We attribute to the author (even though his very existence cannot be specified) the power of each of the successive reinterpretations by saying that "potentially" all of them "were already" there in the *Ur-text* —which we simultaneously know to be wrong (my reading could not possibly be already there in Greece) and perfectly right since I willingly add my little expansion to the "unlimited" fecundity of this collective phenomenon called "*The Iliad*." If it is so unlimited, it is because I push the limit a little bit more. This does mean that there is nothing "inherently great" in the first versions of the great poem, and that to penetrate *inside* this *inherent* greatness, you need to bring with you all of the successive versions, adaptations and accommodations. Nothing is more ordinary than this mechanism: Abraham has become the father of a people "as numerous as the grains of sand" only because he had a lineage. Before the birth of Isaac, Abraham was a despised, barren old man. That he became "the Father of three religions" is a result of what happened to Isaac, and, subsequently, what happened to every one of his later sons and daughters. Such is the "awesome responsibility" of the reader, as Charles Péguy so eloquently said, because this process is entirely reversible; "if we stop interpreting,

if we stop rehearsing, if we stop reproducing, the very existence of the original is at stake. It might stop having abundant copies and slowly disappear."[2]

We have no difficulty raising questions about the quality of the entire trajectory when dealing with the *performing* arts, such as dance, music and theatre. Why is it so difficult when faced with the reproduction of a painting, a piece of furniture, a building or a sculpture? This is the first question we want to clarify.

No one will complain on hearing *King Lear*: "But this is not the original, it is just a representation!". Quite right. That's the whole idea of what it is to *play King Lear*: it is to *replay* it. In the case of a performance, everyone is ready to take into account the whole trajectory going from the first presentations through the long successions of its "revivals" all the way to the present. There is nothing extraordinary in considering that "one good representation of King Lear" is a moment, a segment, in the career of the work of art called *King Lear*, the absolute Platonic ideal of which no one has ever seen and no one will ever be able to circumscribe. In addition, it requires no great sophistication to be fully prepared for disappointment at not finding "the" first, original presentation by Shakespeare "himself", but several premieres and several dozen different versions of the written play with endless glosses and variations. We seem perfectly happy to be excited by the anticlimactic discovery of the source of a major river in a humble spring barely visible under the mossy grass. Third, and even more importantly, spectators have no qualm whatsoever at judging the new version under their eyes by applying the shibboleth: "Is it well or badly (re)played?" They can differ wildly in their opinions, some being scandalized by what they take as some revolting novelties ("Why does Lear disappear in a submarine?") or bored by the repetition of too many clichés, but they have no difficulty in considering that this moment in the whole career of all the successive *King Lears* —in the plural— should be judged *on its merit* and not by its mimetic comparison with the first (entirely inaccessible anyway) presentation of *King Lear* by the Shakespeare company in such and such a year. It is what we see now under our eyes on stage that counts in making our judgment, and certainly not the degree of resemblance with another *Ur*-event hidden from view (even though what we take to be the real "*King Lear*" remains in the background of every one of our judgments). So, clearly, in the case of performance art at least, every new version runs the risk of losing the original —or of regaining it.

So free are we from the comparison with any "original", that it is perfectly acceptable to evaluate a replay by saying: "I would never have anticipated this; it is totally *different* from the way it has been played before; it is utterly *distinct* from the way Shakespeare played it, *and yet* I now understand what the play has always been about!" Everything happens as if some of revivals —the good ones— had managed to dig out of the original novel traits that might have been potentially in the source, but that have remained invisible until now and are made vivid again to the mind of the spectators. So, even though it is not evaluated by its mimetic resemblance to an ideal exemplar, yet it is clear, and everyone might agree, that,

[2] See the commentaries of Péguy in Deleuze, Gilles. *Difference and Repetition (translated by Paul Patton)*. New York: continuum International Publishing, 2005.

because of the action of one of its late successors, the genius of Shakespeare has gained a new level of originality because of the amazing feat of this *faithful* (but not mimetic) reproduction. The origin is there anew, even though it is so different from what it was. And the same phenomenon would occur for any piece of music or dance. The exclamation: "It's so original" attributed to a new performance does not describe one section along the trajectory (and especially not the first *Ur*-version) but the *degree of fecundity of the whole cornucopia*. In performance art, the aura keeps migrating and might very well come back suddenly… or disappear altogether. When so many bad repetitions have so decreased the level of fecundity of the work that the original itself might be abandoned, it will stop being the starting point of any succession. Such a work of art dies out like a family line without any lineage. Like a river deprived of its tributaries one by one until it has shrunk to the size of a tiny rivulet, the work has been reduced to its "original" size, that is, to very little, since it has never been copiously copied, that is, constantly reinterpreted and recast. The work has lost its aura for good.

Why is it so difficult to say the same thing and use the same type of judgment for a painting or a sculpture or a building? Why not say, for instance, that the facsimile of Veronese's "Nozze di Cana" has been *replayed*, rehearsed, revived thanks to a new *interpretation* in Venice in 2007 by Factum Arte, much as Hector Berlioz's *Les Troyens* had been given at last for the first time in London by Colin Davis in 1969 in Covent Garden (a feat that poor Berlioz never managed to witness since he never had the money nor the orchestra to play his original work in full…). And yet, what seems so easy for performance art remains far fetched for the visual arts. If we claim that the *Nozze di Cana* has been "given again" in San Giorgio, someone will immediately say: "But the original is in Paris! The one now in San Giorgio is *just* a facsimile!" A sense of fakery, counterfeiting or betrayal, has been introduced into the discussion in a way that would seem absurd for a piece of performance art (even though it is perfectly possible to say of a very bad company that it made "a sham" at playing Shakespeare). It seems almost impossible to say that the facsimile of Veronese's *Nozze di Cana* is not about falsification but it is a stage in the verification of Veronese's achievement, a part of its ongoing biography.

One reason for this unequal treatment obviously has to do with what could be called the *differential of resistance* among all segments of the trajectory. In his much too famous essay, throughout a deep fog of art historical mysticism, it is this gap in technology that Walter Benjamin pointed out under the name of "mechanical reproduction."[3] In the case of performance art, each version is just as difficult to produce, and just as costly, as the former one (actually more and more expensive as time goes on and certainly more than in Shakespeare's time—just think of the wages for the security guards and all the health and safety standards!). It is not because there have been zillions of representations of *King Lear* that the one you are now going to give will be easier to fund. The marginal cost will be exactly the same —with the only exception that the public will know what "a *King Lear*" is, coming fully equipped with endless presuppositions and critical tests

[3] Benjamin, Walter. "The Work of Art in the Age of Mechanical Reproduction." In *Illuminations*, 217-51. New York: Schocken Books, 1968.

concerning how it should be played (a double-edged sword, as any director knows). This is the technical reason why, in the case of performance art, we don't distinguish between an original and a copy, but rather between successive versions of the same play each designated by the label "version n", "version n+1", "version n+2", etc. It is also why the real play "*King Lear*" is localized nowhere specifically (and often not at the very beginning) but is rather the name given to the whole cornucopia itself (even though each spectator may cherish those special moments in his or her personal history when, because of an exceptionally good "revival", the genius of the *real King Lear* has been "instantiated" more fully than any time before or later). In those cases, the trajectory is composed of segments made, so to speak, of the same stuff or that at least require a roughly similar mobilization of resources.

The situation appears to be entirely different when considering, for instance, a painting. Because it remains in the same frame, encoded in the same pigments, entrusted to the same institution, one cannot help having the impression that every reproduction will be so much *easier* to do and that there will be no possible comparison of quality between the various segments of the trajectory. This is why the aura seems definitely attached to one version only: the autograph one. And certainly this is superficially true: if you take a picture of the *Nozze di Cana* in Paris with your digital camera, no one in his right mind can render commensurable the pale rendering on the screen of your computer and the 67^{m2} of canvas in le Louvre… If you claimed that your picture was "just as good as the original", people would raise their shoulders in pity, and rightly so.

And yet, the distance between "version n" called "the original" and "version n+1" called "a mere copy" depends just as much on the differential of efforts, of costs, of techniques as on any substantial distinction between the successive versions of the same painting. In other words, it is not because of some inherent quality of painting that we tend to create such a yawning gap between originals and copies —it is not because paintings are more "material" (an opera or a play is just as "material" as pigments on canvas)—, but because of the differences in the techniques used for each segment of the trajectory. While in performance art, they are grossly homogeneous (each replay relying on the same gamut of techniques) the career of a painting or a sculpture relies on segments which are vastly heterogeneous and which vary greatly in the intensity of the efforts deployed along its path. It is this asymmetry, we wish to argue, that too often preclude one from saying that the *Nozze di Cana* in Paris has been "reprinted" or "given again" in Venice. And it is certainly this presupposition that so angered the French art historian who castigated her friend for wasting her time in San Giorgio instead of visiting the "genuine Veroneses". Hidden behind the commonsense distinction between original and mere copies lies a totally different process that has to do with the technical equipment, the amount of care, and the intensity of the search for the originality that goes from one version to the next. Before being able to defend itself for re-enacting the original well or badly, a facsimile is discredited beforehand because it is associated with a gap in techniques of reproduction, a gap which is based on a misunderstanding of photography as an index of reality.

The proof of this claim can be obtained by showing what happens to our search for originality when we *modify* this differential —something that becomes easier and easier in the new digital age. That it is not limited to performance art might be made clear by the comparison with the copying of manuscripts. Before printing, the marginal cost of producing one more copy was exactly identical to that of producing the penultimate one —a situation to which we are actually returning now with digital copies. Inside the scriptorium of a monastery, all exemplars were themselves copies, and no copyist would have said that *this one* is the original while *this one* is only a copy —they were all facsimiles— even though great care was of course put into distinguishing a better, earlier, more illuminated version from an inferior one. Here again, the aura was able to travel and might very well have migrated to the newest and latest copy excellently done on one of the best parchments and double checked against the best earlier sources. Naturally, following the invention of the printing press, the marginal cost of one extra copy became negligible compared to the time and techniques necessary to write the manuscript; then, but then only, an enormous distance was introduced, and rightly so, between one part of the trajectory —the autograph manuscript now turned into THE ORIGINAL— and the print run —which, from that moment on, would be considered to consist of mere copies (until of course the great art of bibliophily revealed endless subtle differences between each of the successive prints and forensic digital analysis allowed us to date and order those copies).

There is no better proof that the ability of the aura to be retrieved from the flow of copies (or remain stuck in one segment of the trajectory) crucially depends on the heterogeneity of the techniques used in the successive segments, than to consider what happens to THE ORIGINAL book now that we are all sitting inside that worldwide cut and paste scriptorium called the Web. Because there is no longer any huge difference between the techniques used for each successive reinstantiation of the originals of some segment of a hypertext, we accept quite easily that no great distinction can be made between one version, judged before as "the only original", and later versions, which would be said to be "mere copies". We happily stamp successive renderings of the "same" argument with "version 1", "version 2", "version n" while the notion of the author has become just as fuzzy as that of the aura —not to mention what happens to copyright royalities. Hence the popularity of collective scriptoria like Wikipedia. In effect, Benjamin confused the notion of "mechanical reproduction" with the inequality in the techniques employed along a trajectory. No matter how mechanical a reproduction is, once there is no huge gap in the process of production between version n and version n+n, the clearcut distinction between the original and its reproduction becomes less crucial—and the aura begins to hesitate and is uncertain where it should land.

All of that might be very well, but is it possible to imagine the same migration of the aura in the reproduction or the reinterpretation of, say, a painting? After all, it is the contrast between the *Nozze* and the *Ambassadors* that triggered our inquiry, which would have gone very differently had it been limited

to performance art. One cannot help suspecting that there is in painting, in architecture, in sculpture, in objects in general, a sort of stubborn persistence that makes the association of a place, an original and some aura impossible to separate.

Let us first notice, however, that the difference between performance arts and the others is not as radical as it seems: a painting *has always to be reproduced,* that is, it is always a *re*-production of itself even when it appears to stay exactly the same in the same place. Or, rather, no painting remains the same in the same place without some reproduction. For paintings, too, existence precedes essence. To have a continuing substance they need to be able to subsist. This requirement is well known by curators all over the world: a painting has to be reframed, dusted, sometimes restored, relit, and it has to be represented in different rooms with different accompanying pictures, on different walls, inserted in different narratives, with different catalogues, and with changes in its insurance value and price. So, even though a painting might never be loaned, surviving inside the same institutional setting without undergoing any heavy restoration, it has a career all the same; to subsist and be visible again, it needs to be taken care of. The best proof is that if you don't, it will soon be accumulating dust in a basement, be sold for nothing, or will be cut into pieces and irremediably lost. Such is the justification for all the restorations: if you don't do something, time will eat up that painting as certainly as the building in which it is housed will decay, or as surely as the institutions supposed to take care of it will start decomposing. If in doubt about this, imagine your precious works of art housed in the Kabul National Museum…. For a work of art to survive, it requires an ecology just as complex as one needed to maintain the natural character of a natural park.[4]

If the necessity of reproduction is accepted, then we might be able to convince the reader that the really interesting question is not so much to differentiate the original from the facsimiles, but to be able to tell apart the good reproduction from the bad one. If the *Ambassadors* has been irreversibly erased, it is not out of negligence, but, on the contrary, because of an excessive zeal in "reproducing" it. What the curators did was to confuse the obvious general feature of all works of art —to survive they have to be somehow reproduced— with the *narrow notion of reproduction provided by photographic posters while ignoring many other ways* for a painting to be reproduced. For instance, they could have had a perfect facsimile registering all its surface effects in 3-D and restored the copy instead of the work itself. If they had done this they could have invited several art historians with different views to suggest different ways of restoring the copy and produced an exhibition of the results. Their crime is not to have offered a reproduction of the Holbein *instead of* the Holbein itself to the visitors of the National Gallery — "the Ambassadors" remains behind all the successive restorations much like *King Lear* does over each of its replays, granting or withdrawing its auratic dimension at will depending on the merit of each instance— but to have so limited the range of reproduction techniques that they have chosen one of the most barren one: the photograph—as if a painting were not a thick material but some ethereal design that could be lifted out of its materiality and downloaded into any reproduction

[4] Western, David. *In the Dust of Kilimandjaro* . New York: Shearwater/Island Press, 1997.

without any loss of substance. Actually, a terribly revealing documentary shows the culprits restoring the Holbein by using as *their* model *photographs* of the original and subjectively deciding what was original, what had decayed, what had been added, and imagining the painting as a series of discrete layers that can be added or removed at will—a process that resembles plastic surgery more than an open forensic investigation.

Thus, what is so extraordinary in comparing the fate of the *Ambassadors* with that of the *Nozze* is not that they both rely on reproduction —this is a necessity of existence— but that the first relies on a notion of reproduction that makes the original disappear for ever while the second *adds* originality to the original version by offering it new dimensions *without* jeopardizing the penultimate version — without ever touching it, thanks to the delicate processes used to record it.

But, one might ask, how could any originality be added? One obvious answer is: by bringing the new version to its original location. The cognitive dissonance undergone by the visitor in the *Mona Lisa* room comes in part from the fact that in Palladio's refectory every single detail of the *Nozze* has a meaning entirely lost and wasted in the awkward situation provided for the version n-1 in Paris. In other words, originality does not come to a work of art in bulk; it is rather made of different components, each of which can be inter-related to produce a complex whole. New processes of reproduction allow us to see these elements and their inter-relationship in new ways. To be at the place for which it had been conceived in each and every detail is certainly one aspect—one element— in what we mean by an original. Well, on that ground, there is no question that it is the facsimile of the *Nozze* that is now original and that it is the version in Le Louvre that has *lost* at least this comparative advantage.

We should not however be too mystical about the notion of an "original location" in the case of the Veronese since the very refectory in which the facsimile has been housed is itself a reconstruction. If you look at photographs taken in 1950, you will notice that the original floor was gone and another had been installed at the height of the windows. The top was a theatre and the basement a wood workshop— the whole space had been altered. It was rebuilt in the 50's, but the plaster and floor were wrong and the boisserie that surrounded the room and added the finishing touches to the proportion of the room was missing. In its stripped down state, it looked more like a high protestant space that almost seemed to laugh at the absence of Veronese's counter reformation flourish. But now the effect of the facsimile is such that there are rumors that the return of the painting has triggered a plan for a new restoration that will retrospectively return the space to its former glory. A facsimile of a heavily restored original, now in a new location, was causing new elements to be added to an original in its original location that is in part a facsimile of itself. Originality once seemed so simple…

The same is certainly true of *availability*. What angered the visitor so much in Le Louvre was that she could not actually scan visually the *Nozze* without bumping into *Mona Lisa* addicts. The Veronese is so full of incident and detail that it cannot be seen without time to contemplate its meaning, implications and the

reasons for its continued importance. What does it mean to enshrine an original, if the contemplation of its auratic quality is impossible? This, too, is another element that can be prized away and distinguished from all the others. Actually, this component of originality does not need to go with the originality of the location: the best proof of this may lie in the facsimile of the burial chamber from the Tomb of Thutmosis III in the Valley of the Kings.[5] It contains the first complete text of the Amduat to be used in a pharaonic tomb. The Amduat is a complex narrative mixing art, poetry, science and religion to provide a coherent account of life in the afterworld. The tomb was never made to be visited and the physical and climatic conditions inside the tomb are incompatible with mass tourism. As a result, the tomb is deterioriating rapidly and glass panels have had to be installed to protect the walls from accidental damage and wear and tear. However, the interventions in the tomb change its nature and inhibit both detailed study of the text and an appreciation of the specific character of the place. Exhibitions that present the facsimile and contextualize the text have now been visited by millions of people in North America and Europe. The delocalized facsimile has established the reasons for its continued importance, turned the visitors into a pro-active force in the conservation of the tomb, and could become part of a long term policy that will keep the version n-1 safe but accessible to the small number of specialists who require access for continued study and monitoring. See? Each of the components that together comprise what we mean by a true original begin traveling at different speeds along the trajectory and begin to map out what we have called the catchment area of a work of art.

A third element of originality has to do with the *surface features* of a work. Too often, restorers make a mockery of the materiality of the original they claim to protect by limiting matter to shape only because they confuse 3D with 2D. If there is one aspect of reproduction that digital techniques have totally modified, it is certainly the ability to register the most minute three dimensional aspect of a work without putting the work at risk. It is often forgotten that in its early years the British Museum used to take plaster casts of their objects and the first British Museum catalogue contained a list of copies that were available and for sale. It is often forgotten because the plaster cast collection was discarded at the end of the 20th century and valuable information about the surface of works when they entered the museum was lost. Many of the moulds still contained the paint that was removed during the casting process and subsequent restorations of the originals have dramatically altered the surface and appearance of many of the objects. So, even for a work of art to be material is a question of complex trajectories. Many Venetians, when they first heard of the *Nozze* fac simile,

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[5] The facsimile of the tomb (in its current condition but without the elements that turn the environment into a museum) has resulted in detailed publications by the egyptologist Erik Hornung and the psychologist Theodor Abt in both film and book form.

Hornung, Erik and Abt, Theodor. *The Dark Hours of the Sun -- The Amduat in the tomb of Thutmose III*, DVD, Pubished by Factum Arte , 2005

Hornung, Erik and others. *Immortal Pharaoh- the tomb of Thutmose III*. Madrid, Factum Arte, 2006

immediately conjured up in their mind a glossy flat surface much like that of a poster, and they were horrified at the idea of being given this in reparation for Napoleon's cultural rape of San Giorgio. Little could they anticipate that the facsimile was actually in pigment on a canvas coated with gesso, "just like" Veronese had used. When it was unveiled, there was a moment of silence, then ecstatic applause and many tears. Large numbers of Venetians had to ask themselves a very difficult question: how is it possible to have an aesthetic and emotional response in front of a copy? This question is followed by another: how do we stop Venice from being flooded with bad copies without the criteria to distinguish between good and bad transformations?

Once again, digital techniques allow us to distinguish features that are being regrouped much too quickly into the generic term "reproduction". As we have seen, exactly the same intellectual oversimplifications and category mistakes happened when Benjamin wrote about "mechanical reproduction". Surely the issue is about accuracy, understanding and respect - the absence of which results in "slavish" replication. The same digital techniques may be used either slavishly or originally. It depends again on what features one chooses to bring into focus and which ones are left out. The use of tiny painted dots based on photographs rather than the broader brush marks used to make the original may give the restorer more control and hide the interventions but surely it proves that a *manual* reproduction might be infinitely more disputable and subjective than any "mechanical" one. The road to hell is paved with good intentions.

No doubt, it is an uphill battle: facsimiles have a bad reputation —people assimilate them with a photographic rendering of the original— and digital is associated with an increase in virtuality. So, when we speak of "digital facsimiles", we are certainly looking for trouble. And yet we claim that, contrary to common presuppositions, digital facsimiles are introducing many new twists into the century old trajectory of works of art. There is nothing especially "virtual" in digital techniques —and actually there is nothing entirely digital in digital computers either![6] The association of digitality with virtuality is entirely due to the bad habits given by only one of its possible outputs: the pretty poor screen of our computers. Things are entirely different when digital techniques are only one *moment* in the move from one material entity—Veronese' *Nozze* version n-1 in Le Louvre—to another equally material entity—version n +1 in San Giorgio. During this time of mass tourism, increasingly vocal campaigns for the repatriation of spoils of wars or commerce, when so many restorations are akin to iconoclasm, when the sheer number of amateurs threaten to destroy even the sturdier pieces in the best institutions, it does not require excessive foresight to maintain that digital facsimiles offer a remarkable new handle to give to the notion of originality what is

[6] Lowe, Adam, and Simon Schaffer. N01se, 2000. An Exhibition Held Simultaneously at Kettle´s Yard, the Whipple Museum of the History of Science, Cambridge, the Museum of Archaeology and Anthropology, Cambridge and the Wellcome Institute, London. Cambridge: Kettle's Yard, 2000; Smith, Brian Cantwell. *Digital Abstraction and Concrete Reality*. In Impressiones, Calcografia Nacional, Madrid, 2003.

required by the new time. Since all originals have to be reproduced anyway, simply to survive, it is crucial to be able to discriminate between good and bad reproductions.

APPENDIX

The process used to create an accurate facsimile of Les Noces de Cana by Paolo Caliari (called Véronèse).

Adam Lowe

In the autumn of 2006, the Musée du Louvre reached an agreement with Fondazione Giorgio Cini and granted Factum Arte access to record Veronese's vast painting Les Noces De Cana. The conditions were carefully specified: the recording must be completely non-contact, all equipment must meet the highest conservation specifications and be approved prior to use in the museum, no external lighting or scaffolding could be used, work could only happen when the museum was closed and no equipment could be left in the room when the public was present. In defining each condition the safety of the painting (and the other paintings in the room) was always the decisive factor.

To record this 67.29 square meter painting at actual size and at the highest possible resolution, Factum Arte built a non-contact colour scanning system that uses a large format CCD and integrated LED lights. The scanning system records at a scale of 1:1 at a maximum resolution of 1200 dpi. The scanning unit is mounted onto a precision built telescopic mast, which is operated by an air-pump and can accurately position the scanning unit on the vertical axis. It has a maximum reach of 8 meters from the ground, is fitted with a linear guide to position the scanning head in front of the painting, and has an ultra-sonic distance sensor to ensure that the scanning head is a uniform distance from the painting and is always positioned parallel to the picture surface. This is essential to ensure that each file can be merged together without scale, focus or perspective distortion. The scanning takes place at 8cm from the surface of the painting.

The scanning head moves over the surface illuminating the area that is being recorded. LED light contains no ultraviolet rays and generates minimum heat. The painting was scanned in 37 columns and 43 rows. Each capture was 22 x 30.5cm with an overlap 4cm on the horizontal dimension and 7cm on the vertical dimension. Each file was saved in 2 formats (Tiff and Jpeg). The Tiff is the working file and the Jpeg is a reference file. The recording was done at 600 dpi with 16 bit depth of colour. During the recording of "Les Noces de Cana" 1,591 individual files were saved in Tiff format resulting in an archive of 400 gigabytes.

The telescopic mast was also used for conventional photography using a Phase One H25 digital back fitted to a medium format Hasselblad body. The Phase One records 5488x4145 pixels (22 megapixel) with a pixel size of 9x9 microns and 48 bit colour (16 bit per channel). The photography was done in 450 sections (18 columns and 25 rows) using the ambient light in the room. For reference, a photograph of the complete painting was taken with the camera positioned on a tripod in front of the Mona Lisa at the other end of the room ensuring minimum distortion. The archive of photographic data consists of 593 different files totalling 41 gigabytes of data.

The lower part of the painting was recorded using a non-contact 3D scanning system made by NUB 3D (Spain). No markers, spheres or registration

systems are fixed to the object. The average working distance is about a meter away from the surface being recorded. The NUB 3D Triple White Light Scanning System uses a mix of optical technology, 3D topometry and digital image processing to extract 3D coordinates from the surface of an object. This technique, known as structured white light triangulation, produces accurate measurements of the surface by analysing the deformation caused when lines and patterns of light are projected onto the surface of an object. Multiple images are captured by an integrated camera in the measuring head and using these images the system's integrated technology calculates a co-ordinated X, Y, Z point cloud relating to the surface of the object. About 10 sq meters of the painting were recorded in 3D at a resolution of between 400 and 700 microns. The scanning was done in sections of one meter square generating an archive of about 1 gigabyte. Due to the tonal difference of the surface and the varnish a multi-exposure option was used. For the alignment and post processing Invometric Polyworks software was used.

During the recording extensive colour notes were made using a series of colour sticks made on site and matched to specific points on the surface of the painting. These were fixed into a book containing a 1:1 scale line drawing of the painting. A bit of the colour stick was cut off and fixed into the book at the corresponding point on the painting.

The first task of assembling and aligning the data, carried out while working in the Musée du Louvre was to pre-assemble all the columns using Photoshop Scripting. This resulted in a roughly assembled image of the entire painting. The final assembly, carried out in Madrid, was to reduce the 1,591 individual files into larger units accurately joined together. The vertical columns were used as the basic unit and each scan was accurately assembled into strips comprised of 8 or 9 scans. Each full column is made of 5 of these files. The file size of each unit is about 1 gigabyte. 185 of these units make the whole painting (with overlaps).

The edges of the painting were accurately assembled in order to give an absolute reference. Three horizontal lines were established across the painting to ensure no distortion was taking place. Four vertical lines were then stitched to these horizontals and the resulting blocks were filled in the same way, sub-dividing each one into horizontal and vertical areas. This avoided any compound distortion and ensured an accurate master file. The master file was broken down into manageable units (file size under 12 gigabytes) with an accurate reference to each adjoining unit. Once these units were finalized the individual scans were flattened. The painting was then divided into 1 x 2 meter blocks - these blocks are the printing units. There are 44 printing units.

The scanner data and the colour photographic data have to be treated independently but aligned in perfect registration. The photographic data (recorded in 16 bit depth of colour per channel in RGB) has to be mapped onto the basic scanner data unit of 1 x 2 meters. The scanner data contains no distortion but the camera data always contains some lens and perspective distortion. To join these two types of information, each photograph has to be generally distorted and then locally transformed, using transparency in different

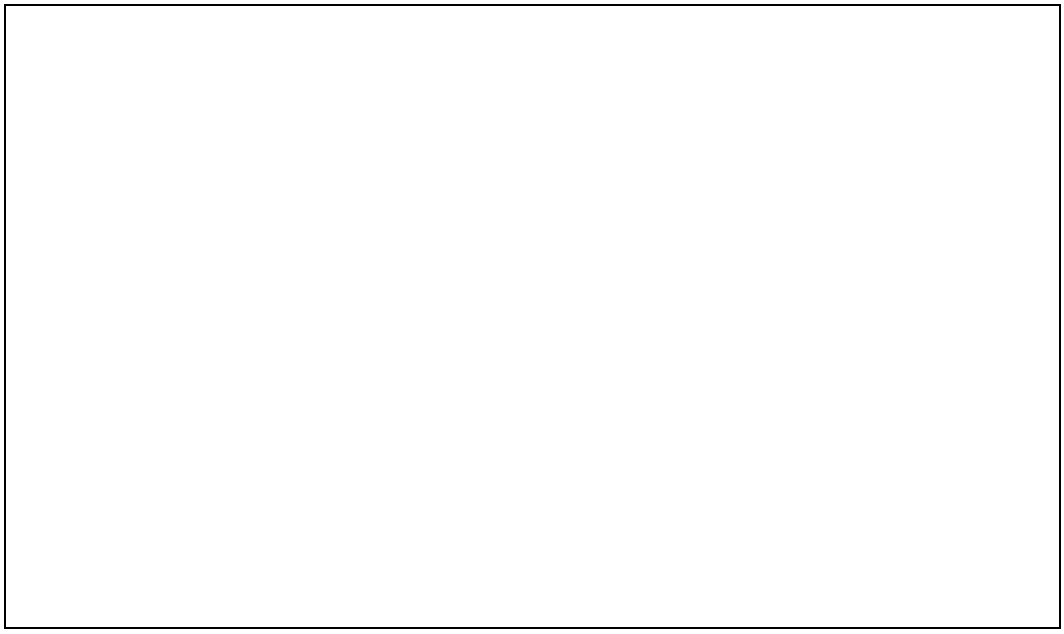
blending modes depending on the nature of the data. This is mainly done using features in the picture such as brush marks or 'noise' within the canvas.

When more than one data set is used, the usual difficulties of color printing increase exponentially. The aim of the colour adjustments was to make Factum Arte's flatbed printer match the colour sticks recorded in the Musée du Louvre. The monitors were all calibrated to the colours that were being printed onto the gesso coated canvas. The colour of the gesso is not a pure white so it was important to create a range from the lightest white to the darkest black. The exact matching of all the colours was then a question of trial and error involving changes to both the digital files and the gesso mix. Printing began with the panel at the bottom left of the painting and further changes were made until both the tone and the colour of the two layers printed together matched the colour sticks after the print had been varnished. Every change was archived and then simplified gradually resulting in a series of Photoshop "actions". One set of actions was applied to the Phase One data and another to the Cana Scanner data. Once finalized, these actions were applied to all 44 printing files and small versions of each file were printed. During the recording the lighting conditions for the photography and the scanning were kept constant so these universal actions, in theory, result in accurate colour matching across all parts of the 67 sq meter canvas.

After printing the tests and comparing them with the colour sticks further local corrections were made to specific colours that were not exact in terms of hue and tone. This mainly applied to areas with a lot of whites or with complex greys and blacks. These changes are made using locally applied masks to isolate specific areas of the painting.

The facsimile was printed on Factum Arte´s purpose-built flatbed printer. This is based on an Epson Pro 9600 digital printer. The printer uses pigment inks in seven colours (cyan, light cyan, magenta, light magenta, yellow, black and light black). The bed is fixed and the print heads move up and down the bed on linear guides. The movement of the heads is accurate to a few microns. The height of the heads can be adjusted during printing. This enables the image to be printed onto gesso coated canvas in pigment. The gesso coating uses no metal oxides and is a mixture of animal glue, calcium carbonate and precipitated chalk. The texture on the surface of the 16 oz. Irish Flax is made from flax fibres and threads mixed with the gesso. Acetate sheets are printed with the Phase One H25 data and used for the positioning of all the texture onto the surface of the canvas. Due to its history "Les Noces de Cana" has a complex and unusual surface. To reproduce this appearance, each piece of canvas is coated with a layer of animal glue, a layer of gesso and fibres and then two layers of gesso. The acetate sheets are then used with a pin registration system to accurately locate the print on the prepared canvas. Each panel is printed twice in perfect register. The first layer to be printed is the information recorded on the Phase One H25. The second layer is the scanner data. The overprinting results in accurate colour matching and a control of the tonal values of the painting. The entire image was divided into printing files of 110 x 220. Each file has 10 cm of overlap. The printed panels are varnished with a satin Golden acrylic varnish with UVLS (an ultra-violet filter).

Ten 20mm thick Alucore panels were made. Each panel is 340 x 205.2 cm. When perfectly aligned in two rows of five panels they make up the whole painting. Each of the large aluminium panels is assembled from 6 printed panels with some of the panel overlapping the edges. First the printed panels are laid out on the surface and perfectly aligned. They are then spliced together with irregular cuts that follow features in the painting. Straight lines are always avoided. The canvas is then fixed to the aluminium with PVA. The joins resulting from the stitching of the printed panels are then retouched by hand by a team of trained conservators. The joins are first filled with a mixture of Golden acrylic moulding paste and glass microspheres. When the join has been carefully filled it is first tinted and then retouched using Golden acrylic paint. During this process a gloss Golden varnish is used. A Golden gel is then used for the final texture and to enhance selected brushmarks and areas of impasto paint. A final coat of satin Golden varnish with UVLS is applied.

The honeycomb aluminium panels, with the retouched printing, were sent to Venice in sections and then fixed on site to an aluminium frame. This was done in two parts which were then lifted into place and fitted onto the wall. The final filling, retouching and control of the surface was done when the facsimile was in its final position and with the lighting that exists in the refectory.

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