

Nineteenth-Century Art Worldwide

a journal of nineteenth-century visual culture

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Sculpted Glyphs: Egypt and the Musée Charles X: Project Narrative

Nineteenth-Century Art Worldwide 13, no. 1 (Spring 2014)

Citation: Elizabeth Buhe, with David Eisenberg, Nicholas Fischer, Daniel Suo, "Sculpted Glyphs: Egypt and the Musée Charles X: Project Narrative," in Elizabeth Buhe et al., "Sculpted Glyphs: Egypt and the Musée Charles X," *Nineteenth-Century Art Worldwide* 13, no. 1 (Spring 2014), <http://www.19thc-artworldwide.org/spring14/sculpted-glyphs-project-narrative>.

Published by: [Association of Historians of Nineteenth-Century Art](#)

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Abstract:

This article proposes that the linguist Jean-François Champollion posited a new theory of Egyptian art in the mid-1820s and takes his theory as a means for interpreting France's first museum of Egyptian antiquities, the Musée Charles X, of which he was curator. This interpretation is made possible through the unprecedented use of digital tools to visualize a historic museum display. In addition to a scholarly essay and downloadable primary source material, this article invites readers to explore a fully-navigable, three-dimensional model of the Musée Charles X.

Digital Humanities and Art History

sponsored by The A.W. Mellon Foundation

Sculpted Glyphs: Egypt and the Musée Charles X: Project Narrative by Elizabeth Buhe

with David Eisenberg, Nicholas Fischer, and Daniel Suo

Elizabeth Buhe, Author

Restage, remount, remake, re-create, reconstruct, and reconfigure are all words marshaled by writers reviewing the 2013 iteration of Harald Szeemann's renowned 1969 exhibition *Live in Your Head: When Attitudes Become Form* at the Fondazione Prada in Venice.^[1] The panoply of terms suggests that no single word holds just the right connotation, or, perhaps, that the very act under examination lacks the precision to be nailed down so easily. Said differently, the re-mounting/making/staging of a historic exhibition is ontologically nebulous. Moving in the other direction—from specificity to generality—art critic Holland Cotter diagnosed the Venice exhibition as part of a larger art-world phenomenon: a “remake culture, an epidemic of re-enactment fever.”^[2] It is this last term, re-enactment, that I seize upon here because it is useful for theorizing a very different historical exhibition, one in the Louvre's Musée Charles X, or, more precisely, a virtual iteration of it.^[3]

To consider the navigable virtual model published here as a scholarly re-enactment is to acknowledge at the outset its temporal, spatial, and subjective nature. The physical experience of viewing the exhibition in the years immediately following 1827, as well as the contemporary virtual one, unfolded (or unfolds) both in time and according to the agency or preference of the individual as he or she moved (or moves) through space. The emphasis on contingency is crucial, too, when considering the maker: a re-enactment recognizes the subjectivity of its actors. Cinema theorist Ivone Margulies has discussed re-enactment as “the attempt to both respect and re-interpret the original event,” underscoring the status of the re-enactment (here, exhibition) as something other.^[4] Said differently, a re-enactment does not purport to be a facsimile, a replica, an index, or a forgery, insofar as those terms connote either precision or value. Re-enactment opens up the potential for interpretation at a remove. In this sense, I agree with Fiona Cameron, who has written that there is “a need to move away from formalist notions of technology and materiality, the original and the authentic, and the desire to make digital objects fit into the rubric of the replicant.”^[5] One way to do so is to shift focus from the object's materiality to its role as information transmitter.^[6] As interpretative tool, a re-enactment can be just as complex as the actual event.

Though the virtual re-enactment of Champollion's display of Egyptian objects is based on detailed notes in archival inventories, what is visible in the virtual iteration is not exactly what

a visitor to the Louvre would have seen upon entering these same galleries in the late 1820s. It is necessarily imprecise. Unlike a traditional image (such as a painting), which is an abstraction of the first order because it abstracts from the real world, a re-enactment is an abstraction of the second (or third) order because it abstracts from a text, which in turn abstracts from the real world. The Musée Charles X re-enactment is a third-order abstraction because the text (in this case inventories) abstracts from another text (Champollion's exhibition), which is itself an interpretation of the real (albeit ancient) world. Located at multiple removes, subjectivity doubly (or triply) permeates a re-enactment. In this project narrative I acknowledge my own subjectivity in this "virtual curation" by sharing some ways in which the virtual exhibition differs from the historic one, and the project collaborators and I offer some thoughts on our working process. In what follows, I explain some of the key interpretative choices made in the construction of the virtual model.

Subjectivities Made Transparent

Because the four galleries that were inaugurated as the Musée Charles X in November 1827 still exist, we built the three-dimensional space of the model around photographs that the Louvre authorized us to take of these galleries. We modified these photographs to eliminate anachronistic elements, such as contemporary signage, benches, and cabinetry, as well as all the Egyptian antiquities displayed there to begin with a "clean slate." Archival documents confirm that most wall armoires have remained in place. Two notable exceptions are the cabinets on either side of the fireplace in room 3, the second *salle funéraire*, which initially consisted of only the cabinet's bottom portion, as well as the window vitrines, which historically were placed in every window alcove, though many are no longer present today.

The ceiling painting currently on display in the Musée Charles X's first gallery, *The Genius of France Animating the Arts and Succoring Humanity* by Antoine-Jean Gros, represented a challenge for historical accuracy, because it was executed in 1833, after the fall of the Bourbon monarchy, to replace an earlier work by the same artist that prominently featured the then-exiled King Charles X. Our photography, therefore, recorded the later painting. The earlier work has never been photographed in color, and because it is now rolled up in storage at Versailles, we were unable to commission a photograph of it. Consequently, we could not replace the newer painting with the older one, though this could presumably be done at a later date when high-resolution color photography of the first Gros painting becomes available. To indicate its historical inaccuracy, we blurred the 1833 work. We paid licensing fees through Art Resource to reproduce images of the other three ceiling paintings, as well as for the photographs mapped directly onto any three-dimensional objects. In these cases, copyright and photography credits appear in the corresponding pop-up windows. The substantial expense of these licensing fees points to the insufficiency of image rights procedures for all art historical publications, and especially for digital publishing platforms and digital humanities projects, which could offer the potential to use such images (if made more accessible) in innovative ways.

Building the three-dimensional objects was extremely costly in terms of time and data. As suggested above, each three-dimensional object was constructed by a graphic artist. Unlike some digital museum projects which utilize 3D laser scanning technology to present a virtual object that is a replica or facsimile of the physical one, the Egyptian antiquities in this re-enactment are not intended to be replicas or substitutes.^[7] Instead, they, like the exhibition

itself, signal a certain distortion or fissure.^[8] Because this re-enactment of the Musée Charles X aims to enable an understanding of Champollion’s curatorial strategy, it is not the materiality or exactitude of these objects that is most significant, but rather the information that they convey.^[9] Drawing upon George MacDonald’s view of the museum as an information disseminator instead of an object repository, this reading facilitates an interpretation of a historic museum display without emphasizing the unique or aesthetic qualities of the work of art.^[10]

As we added more three-dimensional objects to the virtual space, the model began to slow down due to data buildup. In our process of “digital curation,” we began by placing three-dimensional objects in the second gallery (the *salle civile*), but soon began to construct objects as two-dimensional outline drawings, which were less time-consuming to make, were not as “data heavy,” and did not incur licensing fees. These two-dimensional renderings allowed the project to be “conceptually complete” (insofar as interpretative work can still be carried out in all four galleries) even if at the expense of a certain “realism” achieved in the second gallery, which displays only three-dimensional objects.

The selection and placement of objects in the virtual model required the most authorial subjectivity, but it is precisely in visualizing how objects were organized together and in the space of the museum that the re-enactment’s ability to facilitate interpretation resides, because it is here that one can begin to make deductions about Champollion’s curatorial rationale. For logistical reasons (constraints of time, funding, and the amount of data the model can support), it was impractical to include every object that would have been on display during the time Champollion was curator of the Musée Charles X. Moreover, the historical record provides us with an incomplete picture. No extant documents state the precise locations of antiquities acquired prior to the three collections studied here (those of Durand, Salt, and Drovetti), though surely all these objects would have been shown alongside each other in Champollion’s display. The inventories of these three major collections have been transcribed in their entirety and organized by room and cabinet (see [Primary Sources](#)). Of the Egyptian objects in Champollion’s exhibition (some were in storage), not all could be matched with contemporary accession numbers, and of those, a number were not represented with freely available images of a high enough quality to be rendered.

Lastly, it is important to note that interpretative license was taken with the positioning of objects within cabinets. We know in which room and cabinet a given object was displayed, but we do not know if it was on the top or bottom shelf, on the right or left side of the armoire, or presented frontally or at an angle. To the extent possible, we have used historic representations of museum installations as guides to understand contemporaneous display aesthetics, but it must also be remembered that each cabinet was brimming with Egyptian antiquities, so visibility of any one artifact would have been somewhat obscured. It is unlikely that a particular object would have been presented as a rarified aesthetic artwork, and, as suggested in my analysis of his display, Champollion’s aim was to present a collection of like objects in relation to one another to better understand ancient Egyptian society, culture, and theology. To hint at the thousands of objects on display within the Musée Charles X’s cabinets, we populated the low cabinets of the third gallery (the second *salle funéraire*) with dozens of proxy ushabtis. Though the archival inventories clearly delineate the cabinet number in which a given object was displayed, no extant document elucidates the logic with which that

numbering system was applied. While it is logical to assume that cabinet one was followed by cabinet two in sequential order around the perimeter of each gallery, the direction of this order (clockwise or counterclockwise) is an educated guess based upon examination of the armoires' varying sizes and the volume of objects housed in each. A key indicating the cabinet numbering system followed in the virtual model precedes the transcribed portion of the published inventories.

Despite these limiting factors, and in part because Champollion often grouped like objects together, there was enough information to choose a representative sample of objects. In this sense, the virtual model is a re-enactment within certain parameters of possibility; while not a facsimile of the late-1820s display, it nonetheless holds its own interpretative potential.

Re-enactment as Research Tool

While it is important to be clear about the project's limiting parameters, I do not believe these limitations undermine the usefulness of the virtual model, which provides valuable information and enables significant interpretation. Understood as an interpretative tool, the re-enactment can provide unique insights into Champollion's curatorial strategy. The subjective decisions made in the course of developing this project are, in my view, best viewed as research questions to weigh carefully and to address in an informed and transparent manner rather than as obstacles to attempting the project at all. This re-enactment is intended as a supplement to traditional modes of historical inquiry that will enable viewers to pose specific research questions.^[11]

The virtual model was the primary research tool I used when writing my analysis of Champollion's display of Egyptian antiquities in the *salle civile* (see "[Chains of Meaning](#)" in [Sculpted Glyphs](#)). It proved extremely useful as I wrote, and I began to understand Champollion's curatorial work only after viewing the objects in the model. In consultation with an Egyptologist, I selected objects to include in tiered groups, so that additions could be made as new insights were gained. Until this point (and especially when looking at the many pages of transcribed data from the inventories), I had been unable to visualize, and therefore conceive of, the relationships between objects and what those relationships might signify. Before beginning work on the three-dimensional model, I had attempted to map out the exhibition in two-dimensions: both as an elevation and as a bird's-eye plan, but the amount of data exceeded either of these modes of presentation. Given the density of information, images quickly piled on top of images, and I was incapable of making sense of much at all. It is also important to recognize that the experience of viewing the model is necessarily different from the experience of "making" it (selecting objects based upon their relationships to one another), which was both a creative and an analytical exercise that made Champollion's choices apparent to me in a way that they otherwise would not have been. Therefore, creating the model was just as important to the scholarship as its eventual accessibility to viewers. It was important to publish the source data in the form of transcriptions to make this larger analytical process available to readers who might choose to engage with the model in such a way. The written interpretation I provide in "Chains of Meaning" deliberately addresses only one of Champollion's four galleries; I hope that it will serve as a model for the kind of interpretative work that can be further carried out, and improved upon, elsewhere in the virtual space.

In conclusion, a last thought on re-enactment: as with an event, an exhibition re-enacted brings to the fore that which has been lost, something that is no longer knowable in its spatial and temporal form. Perhaps paradoxically, the virtual world, a realm of ephemerality and change, offers permanence to historical situations that no longer exist. While the 2013 iteration of *When Attitudes Become Form* enabled access to an exhibition that was in some ways like the one that was viewable in Bern, Switzerland in 1969, it has since closed. If the interest of that re-staging/re-enactment was Szeemann's curatorial vision (rather than the experience of viewing the works of art shown there), the virtual exhibition offers, perhaps, one useful supplement to the temporary exhibition, a relational practice whose conceit is to bring together objects from near and far and to juxtapose them in constellations that facilitate new insights.^[12] Historic or contemporary, virtual curation enables the re-enactment of curatorial (con)texts, and offers a means of rethinking the practice of curating, its documentation, and its interpretation, past and present.

David Eisenberg and Daniel Suo, Project Collaborators

Background

The Musée Charles X project represented an interesting challenge for [Floored](#), a New York-based technology company that specializes in the capture and rendering of 3D content for real estate. Until the beginning of this project, our work primarily focused on showcase commercial, residential, and retail interiors in interactive 3D models, using next-generation computer graphics. The museum project mainly differed in two ways: first, its focus was on the display of specific antiquities in precise locations, rather than a more general aesthetic objective; second, it involved building a historic space in 3D based on 2D archival documents. For this reason it presented questions of historical accuracy and required “educated guesses” rather than the sharp attention to detail of well-labeled blueprints, which are the norm in the real estate world.

The scope of the project entailed our digital reconstruction of four rooms of the Musée Charles X to create a navigable, interactive, 3D environment and to superimpose a reenactment of its nineteenth-century contents. Such a visualization would serve as both digital tour and research tool, allowing the authors to communicate a historic space that no longer exists. The resulting collaboration combines traditional photographic and 3D modeling techniques with the latest in computer graphics research to produce a photo-realistic 3D model of a visually complex space and optimizes that space for ready interaction through the internet browser.

Challenges in Data Collection

In a typical 3D reconstruction process, we begin by collecting photographic and three-dimensional information on the rooms as they exist today; digital photography provides color and lighting data, while three-dimensional laser scans give depth and scale. Our first challenge was to collect accurate data to aid our construction of the virtual Musée Charles X. Due to logistical issues in shipping the laser and in training a remote photographer on new concepts,

we were unable to obtain any three-dimensional data, forcing us to rely only on the photographic, two-dimensional information for the process. We used high-resolution photography of the same rooms as they exist in the Louvre today. Our photographer used a Nikon DSLR (D5100) using a wide-angle lens (Sigma 10mm), a Nodal Ninja to enable 360° horizontal rotation and 180° vertical rotation, and a tripod for stabilization. We used Hugin open-source software to stitch the photos together into panoramas, which we then in turn mapped onto an empty, 3D wireframe following the architectural contours of the space.

Because we ultimately use the two-dimensional photographic information to “paint” color and lighting onto a blank digital 3D replica, we attempt to take approximately orthographic, rather than perspective, shots of each surface. Perspective views of large surfaces (e.g., intricate ceilings and walls) often look distorted when mapped onto a 3D model, requiring significant editing to ensure that the model looks correct not only from the view of the original camera, but also from any other view to which the user might navigate.

It is important to take high-dynamic-range photographs to which we can then apply tone-mapping algorithms to adjust lighting levels in different parts of the image to ensure that both lighter and darker areas look vivid.

Challenges in Time Estimation

Perhaps the most unanticipated aspect of the project was the time commitment necessary for the completion of the 3D models of the Egyptian antiquities, which had to be modeled by hand using 3D design programs. Often the source imagery for these models was limited to a single set of photographs, rather than 360° around the object, so we spent many hours revising the objects.

To construct the space, we inferred the Louvre’s shape and dimensions from the images we captured on-site. The construction of the architectural 3D model and the 3D objects is a computer-aided process in which an experienced 3D artist references and fuses hundreds of photos to form the basis of a 3D model that fits the views taken from different perspectives. This is not as accurate as cross-referencing the photographic data with three-dimensional data, but a skilled artist can still achieve excellent results.

As we were building the four rooms, we also began work in parallel building digital versions of select Egyptian objects. While typically the process for reconstructing objects would be similar to reconstructing spaces (i.e., combining three-dimensional and two-dimensional data), we chose to create interpretations of those objects, rather than digital replicas. In some cases, creating interpretations was much easier than creating replicas; we could quickly build objects with simple shapes and textures. However, others were significantly more time-consuming, as a digital artist would have to recreate an object and any associated designs much as the original artist may have had to, albeit in different media. It should be noted that the complexity and non-linearity of the object’s external profiles substantially increased the time it took to build each 3D object. Many of the objects have polygonal complexity in the form of curved forms and complex photographic textures. As we tried to maximize data economy (more below) by keeping the 3D models as simple as possible in the number of polygons used to create each

model, we strove to provide as much photorealism in the 3D shapes as possible, which often required many revisions.

Challenges in Data Size and Optimization for Broad Consumption in 3D

The two primary challenges to working with 3D content today are that it is both difficult and expensive to create, and challenging to consume once created. Using a combination of manual and automatic processes, we were able to speed up the content creation time, but the large amount of data in the final 3D rooms and rendered objects taken together with our choice of distribution—the web—meant making tradeoffs between content and ease of access. 3D content is challenging to consume because it requires both obtaining the underlying data for viewing (i.e., long download times on slow internet connections) and displaying and interacting with that data (i.e., slow on older computers with weaker graphics cards). It is for these reasons that complex 3D games are often installed from a disc onto a player's computer (i.e., no download) and have high minimum computing requirements.

We chose to distribute the content via the web because nearly everyone with access to a computing device has a web browser. However, the internet ecosystem is still in the early stages of displaying complex 3D content through the browser, so we still had to make compromises in both size and complexity of the 3D content as well as in the methods of delivering that content. The primary compromise to reduce content complexity was to use two-dimensional white placards with traced outlines of Egyptian antiquities in place of actual three-dimensional objects to decrease the data used. Other compromises included various data compression techniques that improve both download speed and performance once the application is running, but also reduce image quality.

For viewing interactive 3D content, we recommend Google Chrome and Mozilla Firefox as our preferred browsers alongside modern operating systems such as OSX Mavericks and Windows 8.1. But since WebGL, the technology on which we base our software, is still being implemented by certain browsers, this is not a hard and fast rule. For example, a user may be using Chrome on a new, powerful Windows desktop, but that user may have a graphics card that has not yet been approved by Google for use with WebGL. Further complicating the issue is that even if a user can view WebGL content, his or her machine may not be powerful enough to run the content beyond a slow chug. As a result, we developed a decision tree that figures out a proxy for a user's computing power and what the best solution is for that user to receive the 3D content.

Once the content has been optimized and prepared for delivery, however, not all computers are capable of running that content smoothly or even displaying it at all. As a result, we prepared multiple implementations of our software to cover as broad a set of computers as we could, while also preparing meaningful fallback content (e.g., 2D images and videos) for those who cannot view any 3D content.

This is, to our knowledge, among the most ambitious uses of web-based 3D technologies to research, visualize, and communicate art history in interactive 3D. The project has been both a challenge, from the level of detail required to the amount of content desired, and a privilege.

Though the process was not entirely smooth and took many months of iterations, in our view, it represents one strong data point for the hypothesis that academic work can be aided significantly by technology. We are constantly improving both the content creation and delivery processes, but we are proud to have played a part in this first attempt.

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Acknowledgements

First and foremost I must thank Sylvie Guichard, whose collaboration and enthusiasm have supported this project throughout, as well as David O'Brien, who has been there from the start as a trusted advisor and critic. I am grateful for sustained conversations with Marie-Claude Chaudonneret, Thomas Crow, and Philippe de Montebello, who have each provided guidance that has marked this project considerably. For their keen eyes and minds, I thank Daniella Berman, Marina Kliger, and Elyse Nelson.

Aspects of this project were presented at conferences at the University of Pittsburgh and at the Institute of Fine Arts, NYU, and I am grateful to those audiences for their lively and incisive comments. Thanks are also due to Guillemette Andreu-Lanoë for her support and to the extraordinarily accommodating and generous archivists at the Archives des musées nationaux.

This article would not be possible without the generous support of the Mellon Foundation, which has provided *Nineteenth-Century Art Worldwide* with a three-year grant to build capacity in new technologies in scholarship. Additionally, this article benefited from a Mellon Research Initiative Student Grant awarded from the Institute of Fine Arts, NYU. Early archival research for this article was supported by a Fulbright grant.

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Notes

[1] See, for example, Holland Cotter, “Art’s Future Meets Its Past: Prada Foundation Remounts a 1969 Exhibition,” *New York Times* (August 13, 2013), <http://www.nytimes.com/2013/08/14/arts/design/prada-foundation-remounts-a-1969-exhibition.html?pagewanted=all>; Thomas Crow, “Head Trip,” *Artforum* 25, no. 1 (September 2013): 320–325; and Adrian Searle, “From Prada to Povera: The Venice Biennale Recaptures the Spirit of the 60s,” *The Guardian* (May 31, 2013), <http://www.theguardian.com/artanddesign/2013/may/31/prada-venice-biennale-2013>. For its part, the exhibition catalogue noted that it documented “the process of reconstructing the exhibition ‘When Attitudes Become Form,’ curated by Harald Szeemann at the Kunsthalle Bern in 1969, and its remake ‘When Attitudes Become Form: Bern 1969/Venice 2013’ curated by Germano Celant at Ca’Corner della Regina, Venice, 2013.” Germano Celant et. al., *When Attitudes Become Form: Bern 1969/Venice 2013*, exhibition catalogue (Milan: Fondazione Prada, 2013), 372.

[2] Cotter, “Art’s Future Meets Its Past.”

[3] Jonathan Hay has recently made a cogent argument for the use of the term reenactment in an art historical context. Jonathan Hay, “The Reproductive Hand,” CIHA Colloquium 2013, Otsuka Museum of Art, Naruto, Japan, January 2013. I am grateful to him for sharing this manuscript with me.

[4] Ivone Margulies, “Exemplary Bodies: Reenactment in *Love in the City, Sons, and Close Up*,” in *Rites of Realism: Essays on Corporeal Cinema*, ed. Ivone Margulies (Durham, NC: Duke University Press, 2003), 218.

[5] Fiona Cameron, “Beyond the Cult of the Replicant: Museums and Historical Digital Objects —Traditional Concerns, New Discoveries,” in *Theorizing Digital Cultural Heritage: A Critical Discourse*, eds. Fiona Cameron and Sarah Kenderdine (Cambridge, MA: MIT Press, 2010), 70.

[6] Media theorist Lev Manovich has argued that “synthetic computer-generated imagery is not an inferior representation of our reality, but a realistic representation of a different reality,” a reading that establishes the virtual object differently than the physical object. Quoted in Cameron, “Beyond the Cult of the Replicant,” 54.

[7] See, for example, the excellent Xiangtangshan Caves Project, produced by the Center for the Art of East Asia, Dept. of Art History, University of Chicago, <http://xts.uchicago.edu>. To cite another of many projects currently underway involving 3D scanning of objects in museum collections, see The Petrie Museum’s “Object Analysis E-Learning Resource,” <http://ecatalogue.museums.ucl.ac.uk/views/index.php>.

[8] Because the three-dimensional objects within this model of the Musée Charles X are not intended as replicas or facsimiles, they do not hold the same relationship to their physical counterpart as 3D scans do, and therefore do not pose the same “threat” to the museum (namely deterring “real visits to museums”) as expressed in Stuart Robson, Sally MacDonald, Graeme Were, and Mona Hess, “3D Recording and Museums,” in *Digital Humanities in Practice*, ed. Claire Warwick et. al. (London: Facet Publishing, 2012), 98.

[9] We aimed to scale the 3D objects in the virtual museum as accurately as possible. Contemporary measurements available through online or print catalogues were given precedence over the historic measurements given in the inventories, which were only used in the absence of more recent measurements. In the latter case, equivalents were calculated using the following conversion chart. Conversions of metric system used during the Ancien Régime:

1 ligne: 0.229 centimeter
1 pouce (12 lignes): 2.707 centimeters
1 pied (12 pouces): 32.4 centimeters
1 toise (6 pieds): 1.944 meters
1 aune: 1.18844 meters

Stéphane Castelluccio, *Les Collections royales d’objets d’art de François Ier à la Révolution* (Paris: Éditions de l’Amateur, 2002).

[10] See Cameron, “Beyond the Cult of the Replicant,” 51.

[11] Two other “virtual exhibitions” offer interesting counterpoints to what is published here. *What Jane Saw* “reconstructs” the British Institution’s 1813 exhibition, which was seen by Jane Austen. Though it investigates a historic exhibition, it is not presented in three-dimensions nor is it fully navigable, and as a comparison, raises questions about how two- and three-dimensional approaches to historic museum displays can affect interpretation. Janine Barchas et. al., *What Jane Saw* (University of Texas at Austin, 2013), <http://www.whatjanesaw.org>. Second, the [Uruguayan Museo Virtual de Artes El Pais](#) is an example of a virtual museum with limited navigability. This museum, which was developed in lieu of a brick-and-mortar museum, never existed in the physical world. It instead uses the Internet to overcome financial limitations, enabling wide accessibility to the work of Uruguayan artists.

[12] It is because of the attention to Szeemann’s curatorial vision that I have chosen *When Attitudes Become Form* as a comparison rather than any of the other numerous examples of re-staged historic exhibitions, many which take more interpretative license in terms of display. See, for example, Isabel L. Taube’s review of *The Armory Show at 100: Modern Art and Revolution* in this issue, which addresses the curators’ intent to “evoke’ the spirit of the original show” without attempting to position the artworks in the same positions in which they would have been seen in 1913. [Isabel L. Taube, “The Armory Show at 100: Modern Art and Revolution,” *Nineteenth-Century Art Worldwide* 13, no. 1 \(Spring 2014\).](#)