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Legal and Ethical Considerations for Digital Recreations of Cultural Heritage

Erin L. Thompson*

When William Wright,[1] the British traveler and missionary, visited the ruins of the ancient city of Palmyra in 1874,[2] he brought ropes and grappling hooks[3] "to enable [him] to reach those lofty resting-places of the dead, which all [his] predecessors had sighed in vain to ransack."[4] Nearly 150 surviving limestone tower tombs dot the site. They are elaborate constructions with slots to house up to 300 burials of family members and associates, many sealed with slabs sculpted with portraits.[5] The most evocative represent women with almond eyes from the second and third centuries, weighed down with jewelry, and drawing aside their veils to stare straight ahead into the future.[6]

The acrobatic Wright found to his disappointment that "the highest recesses had been ransacked before [he] scaled them, and that nothing remained but a few mutilated mummies"; he consoled himself by taking a number of skulls, "choosing those that seemed most unlike each other."[7] A fantastically rich city, Palmyra was an oasis in what is now Syria and what was then a crucial stopping place on the caravan routes that brought silk, jade, spices, slaves, and other luxury goods from China and India through the Middle East and on to Rome.[8] Wright was hardly the

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1 *Wright, William (1837-1899) (DNBoo)*, WIKISOURCE (Sept. 18, 2011, 5:28 PM), http://en.wikisource.org/wiki/Wright,_William_(1837-1899)_(DNB00) [http://perma.cc/64X8-NS38].

2 WILLIAM WRIGHT, AN ACCOUNT OF PALMYRA AND ZENOBIA WITH TRAVELS AND ADVENTURES IN BASHAN AND THE DESERT 3–4 (Thomas Nelson & Sons 2007) (1895).

3 *Id.* at 74.

4 *Id.* at 77.

5 Malcom A.R. Colledge & Pascale Linant de Bellefonds, *Palmyra*, OXFORD ART ONLINE (Feb. 23, 2011), http://www.oxfordartonline.com/subscriber/article/grove/art/T064951 [http://perma.cc/JXH4-DD7N].

6 *Funerary Relief of Abuna, Daughter of Nabuna*, YALE UNIV. ART GALLERY, http://artgallery.yale.edu/collections/objects/4535 [http://perma.cc/BA5G-75XF].

7 WRIGHT, *supra* note 2, at 82.

8 Cynthia Finlayson, *The Women of Palmyra–Textile Workshops and the Influence of the Silk Trade in Roman Syria*, SILK ROADS, OTHER ROADS: TEXTILE SOCIETY OF AM. 8TH BIENNIAL SYMP. 70 (2002).

first to loot the art that Palmyra's merchant class left behind, but in 2015, the site faced an even greater threat: the Islamic State ("IS").

IS gained control of the archeological site Palmyra as a result of its conquest of the neighboring modern city of Tadmur and its strategic gas fields.[9] Previously, IS had released videos showing its fighters attacking antiquities and archeological sites with sledgehammers, earthmovers, and explosives at other major archeological sites: Nimrud, Mosul, and Hatra.[10] The voiceovers of the videos claim that the destruction is motivated by piety—by a wish to "remove the symbols of polytheism and spread monotheism."[11]

In March 2016, Syrian governmental forces re-took Tadmur and Palmyra, but not before IS had publically executed Palmyra's retired chief of antiquities, Khaled al-Asaad, and detonated explosives in the site's Temples of Baalshamin and Baal. Built in the first and second centuries CE, respectively, the temples were some of the best-preserved structures from Roman antiquity existing anywhere in the world.[12]

IS's destruction of archeological materials was widely covered in the Western media, and was met with a flurry of projects with the goal of combatting the destruction through the use of digital technologies. Among these, the leading technological use is 3D modeling and printing, which involves using computer software to develop a mathematical representation of a three-dimensional surface of an object and then mechanically adding or subtracting layers of a substance using specialized extrusion or carving tools directed by this mathematical model.[13] These technologies have been hailed in the press as a savior and the remedy to this destruction. It is claimed that we can use these technologies to preserve threatened sites, reconstruct destroyed ones, and

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9 Kareem Shaheen, *Palmyra: Historic Syrian City Falls Under Control of Isis*, GUARDIAN (May 21, 2015, 2:34 PM), http://www.theguardian.com/world/2015/may/20/syrian-city-of-palmyra-falls-under-control-of-isis [http://perma.cc/53N8-WCL8].

10 *See* Kristin Romey, *Why ISIS Hates Archaeology and Blew Up Ancient Iraqi Palace*, NAT'L GEOGRAPHIC (Apr. 14, 2015), http://news.nationalgeographic.com/2015/04/150414-why-islamic-state-destroyed-assyrian-palace-nimrud-iraq-video-isis-isil-archaeology/ [http://perma.cc/3LZJ-3TYX]; Graham Bowley & Robert Mackey, *Destruction of Antiquities by ISIS Militants is Denounced*, N.Y. TIMES (Feb. 27, 2015), http://www.nytimes.com/2015/02/28/world/middleeast/destruction-of-antiquities-by-militants-is-denounced.html.

11 Romey, *supra* note 10.

12 Hwaida Saad & Kareen Fahim, *Syrian Troops Said to Recapture Historic Palmyra From ISIS*, N.Y. TIMES (Mar. 27, 2016), http://www.nytimes.com/2016/03/28/world/middleeast/syria-palmyra.html?rref=collection%2Ftimestopic%2FSyria&action=click&content Collection=world&region=stream&module=stream_unit&version=latest&contentPlacement=6&pgtype=collection.

13 Kate Nodjimbadem, *The Heroic Effort to Digitally Reconstruct Lost Monuments*, SMITHSONIAN MAG. (Mar. 2016), http://www.smithsonianmag.com/history/heroic-effort-digitally-reconstruct-lost-monuments-180958098/?no-ist [http://perma.cc/9LBD-QLV2].

disseminate knowledge of the past cheaply and easily all over the globe.[14] But is it really so simple?

As Cees Hamelink, writing on the ethics of technology, has argued throughout history, "[t]he prevailing trend is to think that all possible problems can be fixed by technological means that do not require ethical reflection."[15] Through all of the outbursts of enthusiasm about the possibilities of technological solutions, only a few scholars, artists, and activists have paused to consider the potential downsides to digital reconstructions of threatened cultural heritage.[16] For example, as detailed by Emma Cunliffe, these technologies involve concerns about the authenticity of the reconstructions and the prioritization of time and funding to reconstruction versus initiatives to aid more directly refugees and other conflict victims.[17]

This article addresses some ethical and legal aspects of another area of concern: control. So far, most of the founders and prime movers of the digital projects that focus on archeological sites in Syria and Iraq destroyed by or under threat from IS are from America or Western Europe. They have not uniformly sought input on the creation, control, or interpretation of images from local residents of the sites. As William Wright demonstrates with his casual looting of Palmyra, Western attention has not always proven beneficial for either the historical or modern residents of Middle Eastern sites. Accordingly, this article investigates the status of copyright and other intellectual property law considerations of these projects within a larger meditation on potential "digital colonialism" concerns.

Part I describes IS's motivations for attacking cultural heritage sites. Part II covers some exemplary digital reconstruction models of cultural heritage sites destroyed by IS. Parts III and IV examine, respectively, the ethical and legal aspects of creating these digital

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14 *See, e.g.*, Katie Nodjimbadem, *The Heroic Effort to Digitally Reconstruct Lost Monuments*, SMITHSONIAN (Mar. 2006), http://www.smithsonianmag.com/history/heroic-effort-digitally-reconstruct-lost-monuments-180958098/?no-ist [http://perma.cc/2RGD-CK2Y]; Mary Karmelek, *The New Monument Men Outsmart ISIS*, NEWSWEEK (Nov. 11, 2015, 7:21 AM), http://www.newsweek.com/2015/11/20/institute-digital-archaeology-preserves-cultural-heritage-middle-east-392732.html [http://perma.cc/L4EN-YWBK].

15 CEES J. HAMELINK, THE ETHICS OF CYBERSPACE 6 (2000).

16 *Tangible Cultural Heritage*, UNESCO, http://www.unesco.org/new/en/cairo/culture/tangible-cultural-heritage/ (defining "Cultural Heritage" as "the legacy of physical artifacts and intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations") [http://perma.cc/Q56A-6RNW].

17 Emma Cunliffe, *Should We 3D Print a New Palmyra?*, CONVERSATION (Mar. 31, 2016, 8:07 AM), https://theconversation.com/should-we-3d-print-a-new-palmyra-57014 [http://perma.cc/SBN6-PMUU].

models. I conclude by offering some best practices for creators of digital models who wish to avoid potential ethical pitfalls.

I. THE ISLAMIC STATE'S MOTIVATIONS FOR DESTROYING CULTURAL HERITAGE

Destruction of cultural heritage is not IS' only goal. Reports from inside IS-controlled territory are fragmentary, but archeologists analyzing satellite photographs are seeing pits dug by looters spread across the thousands of archeological sites in Iraq and Syria.[18] IS is not the first to loot, but it has sped the pace of the looting by encouraging professional looters with heavy machinery and archeological knowledge to dig archeological sites in return for payment to IS of a 20% "tax" on the value of what they find.[19]

According to Amr Al-Azm, a professor of anthropology and Middle Eastern history at Shawnee State University, who has been collecting reports from inside Syria, IS even has jihadist bureaucrats charged with issuing official-looking permits allotting sites to approved looters, appraising their finds, and connecting sellers to foreign dealers who take possession of the artifacts at the Turkish border.[20] From there, the material goes underground. Turkish and Lebanese authorities have announced the seizure of a few hundred objects, but we can only guess where the rest are going.[21]

The potential rewards for those dealing in antiquities are high: in 2007, an ancient Near Eastern statuette of a lioness, barely three inches high, sold for $57.2 million (although part of this price was due to the work's documented provenance).[22] Usually, the looters at the beginning of the chain that brings an antiquity from the ground to a place of pride in a collection earn

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[18] *See Imagery of Archaeological Site Looting*, BUREAU OF EDUC. & CULT. AFF., http://eca.state.gov/cultural-heritage-center/syria-cultural-heritage-initiative/imageryarchaeological-site-looting [http://perma.cc/3FNS-3XP2].

[19] *Dangerous "Uphill Battle" to Save Syria's History*, CBS NEWS (Mar. 20, 2015, 7:01 AM), http://www.cbsnews.com/news/syria-antiquities-looted-destroyed-war-isis-modern-monuments-men/ [hereinafter *Uphill Battle*] [http://perma.cc/4888-BJYS]; Amr Al-Azm, Salam Al-Kuntar & Brian I. Daniels, *ISIS' Antiquities Sideline*, N.Y. TIMES (Sept. 2, 2014), http://www.nytimes.com/2014/09/03/opinion/isis-antiquities-sideline.html?_r=0.

[20] *Uphill Battle*, *supra* note 19; Al-Azm, Al-Kuntar & Daniels, *supra* note 19.

[21] *See* Samar Kadi, *Narrowing Markets for Illicit Trade of Syrian Antiquities*, DAILY STAR (Mar. 14, 2015, 12:20 AM), http://www.dailystar.com.lb/News/Lebanon-News/2015/Mar-14/290754-narrowing-markets-for-illicit-trade-of-syrian-antiquities.ashx (seizures in Lebanon); Franklin Lamb, *Looting is the Greatest Threat to Our Cultural Heritage*, FOREIGN POL'Y J. (Dec. 29, 2014), http://www.foreignpolicyjournal.com/2014/12/29/looting-is-the-greatest-threat-to-our-cultural-heritage-in-syria/ (discussing seizures in Turkey) [http://perma.cc/F5RN-E83W] .

[22] *The Guennol Lioness Sells for $57.2 Million*, ARTDAILY.ORG, http://artdaily.com/news/22531/The-Guennol-Lioness-Sells-For--57-2-Million#.VVYfdflViko [http://perma.cc/L3ME-LPUR].

only one or two percent of the final sales price of the object; the chain of middlemen who smuggle the work from country to country collect increasingly high prices, since the expertise necessary to clear customs is higher than that needed to wield a shovel.[23] IS, by contrast, can collect its 20% because it has created a monopoly in looting. Like the Mafia, IS profits by collecting revenues from other criminals; these criminals pay up because the larger organization efficiently divides up the territory where each smaller player can operate, limiting costly competition so as to maximize the surplus that is available to be skimmed.[24]

One of the most problematic aspects of the trade in looted antiquities is that we can never be sure what was taken. A looting pit might mean that the looters emptied a well-stocked ancient tomb, or it might mean that they went home empty-handed after a long day in the sun.

IS profits from looting, but its destruction of cultural property is a key piece of its overall strategy. IS has demolished far more Islamic than ancient heritage: only 4% of the known destroyed sites are ancient, while more than half are Shia mosques and shrines.[25] IS enacts this destruction with a macabre sense of the theatrical. For example, in June 2014, IS fighters drove through the streets of two adjacent farming villages of Guba and Shireekhan, outside of Mosul, ordering all of the 950 Shia families to leave.[26] They then kidnapped about forty Shia men, but it was not until the fighters raised IS's black flag above a Shia shrine and three Shia mosques in the villages, filling them with explosives and demolishing them, that all of the remaining Shia residents fled.[27]

Destroying Islamic cultural property serves IS's purposes by causing Shia residents to flee, but why is demolishing

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[23] *Iraq/Syria: ISIL/ISI Fundraising by Antiquities Trafficking*, CONFLICT ANTIQUITIES (June 16, 2014, 7:00 PM), https://conflictantiquities.wordpress.com/2014/06/16/iraq-syria-isil-isis-antiquities-trafficking-fundraising/ [http://perma.cc/E2EH-6Y7E]; NEIL BRODIE, JENNY DOOLE, & PETER WATSON, STEALING HISTORY: THE ILLICIT TRADE IN CULTURAL MATERIAL 13 (The McDonald Inst. For Archaeology Res. 2000), http://www2.mcdonald.cam.ac.uk/projects/iarc/research/illicit_trade.pdf [http://perma.cc/9E2E-QDJS]; Neil Brodie, *Pity the Poor Middleman*, 3 THE ILLICIT ANTIQUITIES RES. CENTRE 7, 8 (1998), http://traffickingculture.org/wp-content/uploads/2012/07/CWC-3.pdf [http://perma.cc/87P7-5DE4].

[24] I am indebted to Philip J. Cook (Duke University) for these economic insights.

[25] Christopher Jones, *Heritage in Peril: Iraq and Syria (Metropolitan Museum of Art, September 22)*, GATES OF NINEVEH (Sept. 23, 2014), https://gatesofnineveh.wordpress.com/2014/09/23/heritage-in-peril-iraq-and-syria-metropolitan-museum-of-art-september-22/ [http://perma.cc/A6AW-95F3].

[26] *Iraq: ISIS Kidnaps Shia Turkmen, Destroys Shrines*, HUM. RTS. WATCH (June 27, 2014, 11:45 PM), http://www.hrw.org/news/2014/06/27/iraq-isis-kidnaps-shia-turkmen-destroys-shrines [http://perma.cc/7JV2-DQTK].

[27] *Id.*

archeological sites? In part, it is because IS is destroying what it cannot sell. The sculptures pulverized in the videos are too large to transport easily and too recognizable to find a willing buyer.[28] But the destruction also operates as another reminder to Shia, Yazidi, Christian, and other populations that IS considers heretical—that no alternatives to IS's views, even those long dead, will be permitted. Ancient Palmyrans worshipped many deities from many traditions, including Greek, Roman, Persian, and pre-Islamic.[29] It was a city composed of many ethnicities and religions whose citizens were tolerant of diversity. IS seeks to sweep away such tolerance in favor of its dark and singular vision of the world.

II. THE DIGITAL INITIATIVES AIMED AT COMBATTING THE ISLAMIC STATE'S DESTRUCTION

The projects that currently seek to apply digital technologies to threatened cultural heritage fall into several different types.[30] Some focus on enabling the collection and storage of new images of threatened sites, for example by distributing digital cameras equipped with the ability to automatically upload high-quality images to archival servers, while other initiatives work with existing 2D images, combining them in order to

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28 Paul D. Skinkman, *ISIS' Destruction of Antiques at Mosul, Nimrud Hides Sinister Moneymaking Scheme*, U.S. NEWS & WORLD REP. (Mar. 9, 2015, 2:29 PM), http://www.usnews.com/news/articles/2015/03/09/isis-destruction-of-antiques-at-mosul-nimrud-hides-sinister-moneymaking-scheme [http://perma.cc/XGF3-BMHX].

29 *Palmyra*, OXFORD ART ONLINE, http://www.oxfordartonline.com/subscriber/article/grove/art/T064951?q=palmyra&search=quick&pos=1&_start=1#firsthit [http://perma.cc/6JSQ-WYTL].

30 For background on the role of digital technology within the study of cultural heritage sites, see DIGITAL HERITAGE: APPLYING DIGITAL IMAGING TO CULTURAL HERITAGE 549–74 (Lindsay MacDonald ed., 2008). *See generally* DIGITAL ARCHAEOLOGY: BRIDGING METHOD AND THEORY (Thomas L. Evans & Patrick Daly eds., 2005); Mark Gillings, *The Real, the Virtually Real, and the Hyperreal: The Role of VR in Archaeology*, *in* ENVISIONING THE PAST: ARCHAEOLOGY AND THE IMAGE (Sam Smiles & Stephanie Moser eds., 2008); Colleen L. Morgan, *(Re)Building Çatalhöyük: Changing Virtual Reality in Archaeology*, 5 ARCHAEOLOGIES 468; Donald H. Sanders, *The Present and Future of Virtual Heritage*, *in* HOW DO WE WANT THE PAST TO BE? ON METHODS AND INSTRUMENTS OF VISUALIZING THE ANCIENT REALITY (M.G. Micale & D. Nadali, eds., 2007); Juan Antonio Barcelo, *Automatic Archaeology: Bridging the Gap Between Virtual Reality, Artificial Intelligence and Archaeology*, *in* THEORIZING DIGITAL CULTURAL HERITAGE: A CRITICAL DISCOURSE (Fiona Cameron & Sarah Kenderdine eds., 2007). For further thoughts on the intersection of ethics and digital cultural heritage in other spheres, see Deidre Brown, *Te Ahu Hiko: Digital Cultural Heritage and Indigenous Objects, People and Environments*, *in* THEORIZING DIGITAL CULTURAL HERITAGE: A CRITICAL DISCOURSE (Fiona Cameron & Sarah Kenderdine eds., 2007); Sarah Colley, *Ethics and Digital Heritage*, *in* THE ETHICS OF CULTURAL HERITAGE (Tracy Ireland & John Schofield eds., 2015); Kathy Bowry & Jane Anderson, *The Politics of Global Information Sharing: Whose Cultural Agendas Are Being Advanced?*, 18 SOC. & LEGAL STUD. 479 (2009).

create digital models whose detail and quality surpass the individual existing images.[31]

Whether the initiatives work with existing or new images, and regardless of whether they are concerned with threatened or already-destroyed artifacts, they so far have in common the fact that their main "products" are 3D digital models. These models can exist more or less in isolation, as files which allow viewers to examine an object or site virtually, or can be embedded within elaborate presentations that also include supplemental information in the form of text, audio, and reconstructions of vanished elements such as pigmentation, wooden elements, and occupants. These models can even be combined with 3D printing technology to allow the creation of physical recreations, from scale models to life-sized replicas "printed" in concrete.

Three different projects will, in this article, serve as examples for the rest: Rekrei, the Million Image Database, and the "Material Speculation: ISIS" project of the artist Morehshin Allahyari.

Rekrei describes itself as "a crowdsourced project to collect photographs of monuments, museums, and artefacts damaged by natural disasters or human intervention, and to use those data to create 3D representations and help to preserve our global, shared, human heritage."[32] The project, which uses photogrammetric techniques to create 3D digital models, was founded by Matthew Vincent and Chance Coughenour, two Europe-based researchers, as a way of focusing the efforts of those who wanted to volunteer to use their technical skills to do something in the wake of IS destruction. Essentially, the project collects 3D digital models created by users in the Sketchfab platform, which are then displayed at Rekrei.org. These models usually capture a single artifact or element of a site by digitally "stitching" together 2D images.

While Rekrei brings together users with their own interests, the Million Image Database is a project with a much more centralized direction. The Database is the product of the Institute of Digital Archaeology, itself a joint project of Oxford, Harvard,

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31 Besides the projects discussed below, see e.g., CYARK, http://www.cyark.org/ [http://perma.cc/8UMA-E275]; TREASURE CARETAKER TRAINING, http://treasurecaretaker.com/ (coordinating the Digital Monastery Project) [http://perma.cc/8E5S-WGYW]; #NEWPALMYRA, http://www.newpalmyra.org/ (focusing on digital archaeology, cultural development, and open data) [http://perma.cc/JC9D-AUN2]; ACT, http://act.mit.edu/projects-and-events/events/projects/memory-matrix/ (working on the Memory Matrix Project) [http://perma.cc/MB5C-8QGB]; Palmyra 3D Model (@Palmyra3Dmodel), FACEBOOK, https://www.facebook.com/Palmyra3Dmodel/ (last visited Dec. 20, 2016).

32 *Rekrei: A Summary*, REKREI, https://rekrei.org/about [http://perma.cc/7XAS-PU44].

and the Museum of the Future in Dubai.[33] This project has designed and is distributing low-cost, easy-to-use 3D cameras—nearly 1000 already, with plans to reach a total of 5000 in 2016—to volunteer activists in conflict zones in Syria, Iraq, Yemen, Afghanistan, Turkey, Jordan, and Egypt. These cameras can record stereoscopic images, capturing detail measured in centimeters. The camera then automatically uploads the images to the project's website. All the technology and software is open-source, to allow others to replicate the project. The Institute says that these images "will be used for research, heritage appreciation, educational programs and 3D replication—including full-scale 3D replication using proprietary cement-based 3D printing techniques."[34] Their goal in doing so is to "ensur[e] that the visual reminders that keep that history alive remain a part of the human experience." [35]

The first full-scale replication already occurred; the Institute created a 3D digital model of an ancient Roman triumphal arch destroyed by IS in Palmyra, working from photographs taken by archaeologists and tourists before the occupation. A scale replica (twenty feet tall instead of fifty feet) of the arch as it existed shortly before its destruction was then carved in marble by robots working from the digital model, and the arch was installed in Trafalgar Square, London in April 2016, with plans to travel to other locations.[36]

The artist Morehshin Allahyari is one of the most vocal critics of digital recreation projects that produce physical objects. She has said that the arch in London is a simplistic gesture since "[t]his is about histories, [and] about institutional relationships. We have to talk about power structures—how it's different when westerners or tech companies save cultural things compared to someone else who actually comes from the culture."[37] Allahyari's own project, "Material Speculation: ISIS," also digitally fabricates and produces 3D printing models of selected archeological artifacts destroyed by IS in 2015, in order to inspect

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33 *Imaging Projects*, INST. FOR DIGITAL TECH., http://digitalarchaeology.org.uk/projects/ [http://perma.cc/AR2D-SNSN].

34 *Id.*

35 *Id.*

36 Christopher D. Shea, *Palmyra Arch Replica Is Unveiled in Trafalgar Square in London*, N.Y. TIMES (Apr. 19, 2016), http://www.nytimes.com/2016/04/20/arts/international/ replica-of-palmyra-arch-is-unveiled-in-trafalgar-square.html; Claire Voon, *What's the Value of Recreating the Palmyra Arch with Digital Technology*, HYPERALLERGIC (Apr. 19, 2016), http://hyperallergic.com/292006/whats-the-value-of-recreating-the-palmyra-arch-with-digital-technology/ [http://perma.cc/7DZS-HX9A].

37 Voon, *supra* note 36.

"Petropolitical and poetic relationships between 3D [p]rinting, [p]lastic, [o]il, [t]echnocapitalism and [j]ihad."[38]

Allahyari's multi-step project first created digital models of the artifacts. This modeling was not a matter of automatically combining 2D photographs since most of the objects, like the sculpture of King Uthal, excavated in the city of Hatra and housed in the Mosul Museum when destroyed by IS, were not the subject of repeated photography from multiple angles.[39] Instead, Allahyari, working from relatively few and low quality images, created digital models with elements of reconstruction where details were not available. Then, Allahyari printed 3D objects from her digital models. However, these printed objects, made in a clear resin and at a much-reduced scale, are clearly different than the destroyed originals. The physical objects also include a flash drive and a memory card inserted within them, holding information in the form of images, maps, PDF files, and videos gathered by Allahyari from multiple sources in multiple languages, including English, Farsi, and Arabic. Allahyari contacted staff from the Mosul Museum itself as well as other archeologists and historians in Iraq, Iran, and America.

The final step of Allahyari's project is to disseminate the files for her reconstructions. In February 2016, she made available free downloads of the files allowing anyone to 3D print her King Uthal object, along with the associated research, and she plans to do the same for all objects in the project in the future.[40]

III. ETHICAL CONSIDERATIONS FOR DIGITAL RECONSTRUCTIONS OF CULTURAL HERITAGE

There are a range of ethical questions associated with the use of digital technology in the cultural heritage sphere, including the political uses of representation and interpretation of cultural heritage; the accessibility or lack thereof of digital representations; the violence to the "authentic" or "real" that the virtual might inflict; the correct approach to data transparency

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[38] Morehshin Allahyari, *Material Speculation: ISIS (2015–2016)*, MOREHSHIN ALLAHYARI, http://www.morehshin.com/material-speculation-isis/ [http://perma.cc/W6P8-XZZG]; *see also* Alexis Anais Avedisian & Anna Khachiyan, *On Material Speculation*, http://www.morehshin.com/wp-content/uploads/2016/03/morehshin_allahyari-material_speculation_isis_brochure-1.pdf [http://perma.cc/SQV8-TKEC].

[39] Christopher Jones, *Assessing the Damage at the Mosul Museum, Part 2: The Sculptures from Hatra*, GATES OF NINEVEH (Mar. 3, 2015), https://gatesofnineveh.wordpress.com/2015/03/03/assessing-the-damage-at-the-mosul-museum-part-2-the-sculptures-from-hatra/ [http://perma.cc/T9WJ-DFJY].

[40] Paul Soulellis, *The Distributed Monument: New Work from Morehshin Allahyari's 'Material Speculation' Series*, RHIZOME BLOG (Feb. 16, 2016), http://rhizome.org/editorial/2016/feb/16/morehshin-allahyari/ [http://perma.cc/6PLB-NE7Y].

and sharing; and the ease both of manipulation and surreptitious capture of digital images.[41] These inquiries also address ethical questions first formatted about traditional photography, such as the responsibility the maker of and the audience for the image bears to its subject, especially when this subject is shown suffering harm.

A.   Embedded Assumptions and Arguments in Past Images of Cultural Sites

Even what would seem to be a simple act—that of merely creating images of cultural heritage sites, such as those made by Rekrei, the Million Image Database, and Allahyari—can be ethically problematic, due to a long history of the use of images by those seeking to create or advance political claims on the pictured territory. Here, I would like to examine at some length one sample image of Palmyra in order to demonstrate how closely and deeply ethical concerns can be integrated into what seem, at first glance, like simple images: Gavin Hamilton's 1758 painting "James Dawkins and Robert Wood Discovering the Ruins of Palmyra."[42]

At first, the observer is uncertain where the man in the center of this painting is pointing. His hand has drifted up out of the heavy folds of an awkward toga, which seems to threaten to fall off at any moment, and could be gesturing towards the foreshortened rear of a horse, which fills the foreground to the left. But then one finally sees, in the far background, the object of his attention: an avenue of ancient columns leading toward an arch, through which shines the setting sun. The man's companion, also smothered in a sagging toga, looks at the ruins and raises his hand in a gesture of surprise and approbation, at the same time raising the heel of his boot, eager to reach the end of his journey.

This is how Gavin Hamilton represented Dawkins and Wood "Discovering the Ruins of Palmyra," painting them seven years after their expedition to the ancient city in what is now Syria and a year after Dawkins's death.[43] His brother commissioned the painting in commemoration.[44] Dawkins was the Oxford-educated son of a wealthy English family who had made its fortune as

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[41] For a survey of these and other concerns, see THEORIZING DIGITAL CULTURAL HERITAGE: A CRITICAL DISCOURSE 437–55 (Fiona Cameron & Sarah Kenderdine eds., 2007).

[42] *See generally* Claire Pace, *Gavin Hamilton's Wood & Dawkins Discovering Palmyra: The Dilettante as Hero*, 4 ART HIST. 271 (1981) (discussing the impact of Gavin Hamilton's work on neoclassicism).

[43] *Id.*

[44] *Id.*

planters in the West Indies.[45] He financed the trip to Palmyra, Baalbek, and other classical sites along the Mediterranean and in the Middle East, and hired an Italian draughtsman to accompany him and make drawings of the sites.[46] Wood eventually published an account of the journey, *The Ruins of Palmyra* (1753), which became very popular in England, less for its short text than for its fifty-seven large, skillful illustrations, ranging from details of carvings to panoramic views of the site, which were the first influential images of Palmyra to reach Europe.[47]

The painter, Hamilton, had never visited Palmyra; at the time of the commission, he was an Englishman resident in Rome, where he made a living less from painting than from excavating and selling Roman antiquities to visiting Grand Tourists.[48] He probably based his depiction of Palmyra on plate no. 20 from the *Ruins of Palmyra*, meaning that the painting shows Dawkins and Woods "discovering" an image that they themselves had been responsible for creating.

It is important to analyze what the painting leaves out. For one, we do not see modern Western clothing. Dawkins and Wood, 18th century Englishmen, are clothed in Roman togas and boots, with Roman hairstyles, as if they were aristocratic inhabitants of the very city whose ruins they are encountering at the peak of its prosperity, in the second century C.E. Hamilton further underscores their claim to an identity with ancient culture by having them make gestures based on those seen in ancient Roman art and showing them in strict profile view, as was the rule for aristocratic figures in ancient Roman friezes and coins.[49]

Besides Dawkins and Wood, there are five other figures in the painting. Four have their attention turned away from the

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45 *Id.*

46 *Id.*

47 The ensuing popularity of Palmyra means that long before the Million Image Database project resulting in the Palmyrene arch in Trafalgar Square, Palmyra travelled to London. A view of Palmyra, based on *The Ruins of Palmyra*, was included among the decorations at the popular pleasure grounds at Vauxhall: "[T]riumphal arches leading to a large and fine painting of Palmyra which has deceived many strangers and induced them at first sight to imagine they see a real pile of ruins at some distance," as described by one visitor in 1762. *See* EDWARD CROFT-MURRAY, *Decorative Painting in England, 1537–1837: The Eighteenth and Early Nineteenth Centuries v.2* (1971); *see also* Pace, *supra* note 42. For more on the way that current virtual reality presentations of cultural heritage connects to a long history of panoramic viewing technologies, from the Lascaux Caves on, see Sarah Kenderdine, *Speaking in Rama: Panoramic Vision in Cultural Heritage Visualization, in* THEORIZING DIGITAL CULTURAL HERITAGE: A CRITICAL DISCOURSE (Fiona Cameron & Sarah Kenderdine eds., 2007).

48 Pace, *supra* note 42.

49 *See* Richard Brilliant, GESTURE AND RANK IN ROMAN ART: THE USE OF GESTURES TO DENOTE STATUS IN ROMAN SCULPTURE AND COINAGE (New Haven: Connecticut Academy, 1963).

ruins: a guard glowers down at the explorers, a guide consults a scrap of paper, and one man pulls on the bridle of a horse to tug it out of the way of an oncoming camel, whose rider is absorbed in controlling his beast. Only the rider of the horse on the left might be looking at Palmyra, but his back is to us and his body twisted into a Michelangelo-like posture that might also leave him looking away from the ruins, in the direction his horse's head points.[50]

Presumably these figures are intended to represent local residents of the area, hired to guide Dawkins and Wood to Palmyra, and yet Hamilton shows them as completely disinterested in the site, almost purposefully ignoring it in the moment it first appears. By contrast to Dawkins and Wood's classical appearance, the other figures are almost aggressively non-ancient, with their modern clothing emphasized through Hamilton's choice of rich and insistent blues, greens, and reds. The figures have a range of skin tones and physiognomies, with Hamilton attempting to portray the different racial identities of groups living in the area, but all five wear turbans, signaling their Islamic faith. Nothing about Dawkins or Wood comparably signals their religion.

The view of Palmyra that Hamilton chose to include also leaves out important information about the site. In the painting, Palmyra looks miraculously intact. The travellers have paused in the shade of a substantial, seemingly flawless structure—one of the tower tombs that once lined the road into the city. The columns and arches the explorers point to in the distance also seem unbroken, with just a few toppled columns to assure the viewer that, after all, this is an ancient town. In reality, then as now, the vast majority of the city was reduced to true ruins, with chunks of anonymous stone scattered over a landscape in which just a few columns and buildings still stood, in heavily damaged states.

Also importantly, the painting gives no hint that the site, far from being one that required any sort of discovery, was inhabited when Dawkins and Wood arrived, and indeed had been continuously inhabited since at least the Bronze Age.[51] The oasis settlement had been known as Tadmur before the Romans conquered it and renamed it Palmyra, after the site's characteristic trees (palm trees feature prominently in Hamilton's painting, to give the educated viewer a hint as to what site they were looking

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[50] On the "figura serpentinata" of Michelangelo and the Mannerists, see generally John Shearman, MANNERISM (STYLE AND CIVILIZATION) (Penguin Books, 1991).

[51] *See generally* IAIN BROWNING, PALMYRA (1979); JEAN STARCKY & MICHEL GAWLIKOWSKI, PALMYRE (1985).

at). Palmyra's wealth diminished after the third century C.E., after a rebellion against the Romans, led by the famed Queen Zenobia, and then with the general decline of the luxury trade on which it depended that accompanied the fall of the Roman empire.[52] But scattered reports through the centuries always show it as a settlement still. In 1691, an English traveller—the first European visitor in the modern age—described Palmyra's population as a "poor miserable dirty people" living in "little huts made of dirt" within the enclosure walls of the sanctuary of Bel, saying that never before had he seen such a mixture of "the greatest state and magnificence together with the extremity of filth & poverty."[53]

The villagers, a handful of families, continued to live in the shadow of the Temple of Bel until 1929, when a French archeological expedition cleared the ruins of Palmyra and moved its inhabitants to a new, adjoining town, named Tadmur after the ancient settlement, meaning that the parents of some living Syrians were born within the temple IS destroyed.[54]

Despite the fact that Dawkins and Wood travelled thousands of miles to reach Palmyra and spent only fifteen days there, Hamilton's painting claims that they are more a part of its culture than the local inhabitants of the region. The logic of the image makes a claim that these locals may spend more time in Palmyra's proximity, but that they are separated from its truth by their religion, their modernity, and, above all, by their indifference to its splendors.

B.   Embedded Assumptions and Arguments in Digital Models of Cultural Sites

It is easier to see how assumptions about knowledge, identity, and culture impact representations of historical sites in images like Hamilton's painting, where these assumptions are writ so large as to become caricatures of themselves—two Englishmen trundling around in togas, "discovering" an inhabited city by following a guide who already knows where it is. But this eighteenth century painting is easy to analyze precisely

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52 *See generally* WARWICK BALL, ROME IN THE EAST: THE TRANSFORMATION OF AN EMPIRE (Psychology Press, 2001); Javier Teixidor, *"Palmyra in the Third Century," in* A JOURNEY TO PALMYRA: COLLECTED ESSAYS TO REMEMBER DELBERT R. HILLERS (Brill, 2005).

53 William Halifax, *A Relation of a Voyage from Aleppo to Palmyra in Syria*, 19 PHIL. TRANS. OF THE ROYAL SOC'Y IN LONDON 83, 86 (1695), http://rstl.royalsocietypublishing.org/content/19/215-235/83.full.pdf+html [http://perma.cc/M4EN-JGRZ].

54 *See* STARCKY & GAWLIKOWSKI, *supra* note 51; *see also* Kanishk Tharoor & Maryam Maruf, *Museum of Lost Objects: The Temple of Bell* (Mar. 1, 2016), BBC NEWS, http://www.bbc.com/news/magazine-35688943 [http://perma.cc/R9AR-SMQB].

because it is so removed from us. It is much more difficult to see the assumptions that underpin our own representations of the past.

One reason that it is so difficult for us to analyze the images we create of Palmyra and other such sites now is our widespread belief that photography is less susceptible to manipulation than are older techniques of image-capture like drawing or painting. But photographs, even if not internally manipulated through what is now a myriad of technologies, can give a false impression as well, simply because of what the photographer includes or leaves out of the frame. If you are acquainted with the Pyramids only through photography, for example, you might think that they rise in isolated splendor in uninhabited deserts. This, at least, is the impression that most photographers seek to include by choosing angles that do not also capture the shops and houses of the surrounding city of Giza, which squeeze as tightly as permitted into the non-heritage space.

So, what do the current spate of digital models of Middle Eastern sites leave out? And what assumptions about sites, visitors, and locals do they embed? I will examine four categories of absence in these models: human figures, alternate interpretations, time, and certain sites.

1. Absence of Human Figures in Digital Models

All three of the exemplary reconstruction projects described in this article are images of artifacts that do not include representations of people, whether ancient or contemporary. This humanless status is characteristic of many digital models of cultural heritage. One exception, a digital video that takes the viewer through a virtually reconstructed Northwest Palace of King Ashurnasirpal II at Nimrud (near modern Mosul in northern Iraq) as it would have appeared during his reign in the ninth century B.C., displayed in the "Assyria to Iberia at the Dawn of the Classical Age" exhibit at the Metropolitan Museum (September 22, 2014–January 4, 2015), helps explain why this is so.[55]

This video begins with the "camera" swooping in from an aerial view that encompasses the whole city of Nimrud—but its streets are deserted, giving the impression that the city is already deserted. Gradually, we reach the palace itself, and here there are occupants. We see twenty-five figures in various courtyards and rooms: guards, attendants, and even Ashurnasirpal himself. But they are curiously indistinct and generalized. They

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[55] *Digital Reconstruction of the Northwest Palace, Nimrud, Assyria*, THE MET (Sept. 18, 2014), http://www.metmuseum.org/metmedia/video/collections/ancient-near-eastern-art/northwest-palace-nimrud [http://perma.cc/PJY4-NEN8].

wear identical clothing, move with identical motions, and would seem to have identical faces, except the viewer never gets close enough to inspect them. And they are all men in the prime of life—none of the women or children or the aged who would have also inhabited the palace.

Why this restricted range of appearance? For the same reason that most digital reconstructions are simply unpeopled: expense.[56] We have the technology to create detailed, realistic digital worlds filled with individualized characters, as is shown in numerous contemporary video games and films. But the costs of the technology and labor to design and animate this type of motion are staggering—a company might employ hundreds of artists and spend millions of dollars to bring a major video game, such as the Grand Theft Auto series, to market.[57]

Heritage projects are unlikely to ever spend more than a fraction of this type of budget. Until technological development proves vastly more efficient in automating animation of the human figure (something which, thanks to the sophistication of the brain in perceiving cues about what is human and what is not, is extremely difficult without falling into the uncanny valley),[58] we will generally see deserted reconstructions, or those with only a few figures, leaving us to imagine the rest.

The problem here is that we are not very good at imagining people we do not see. The empty spaces of digital reconstructions can appear ready for conquest in the same way, for example, that early European settlers imagined the landscape of America to be empty. Paintings, drawings, and later photographs showed vast stretches of land without any evidence of human inhabitants. The artists aiming their attention away from Native Americans and their settlements helped elide their existence and claims to the land. Similarly, the emptiness of digital reconstructions leave the viewer free to claim those spaces for his or her own interpretation and identification.

2. Absence of Alternate Interpretations in Digital Models

Another way in which expense factors into ethical concerns about digital recreations is in the choice of information included

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[56] For suggestions on how to use game-based technologies to increase user engagement in virtual heritage spaces and decrease their feeling of dehumanization, see Bernadette Flynn, *The Morphology of Space in Virtual Heritage, in* THEORIZING DIGITAL CULTURAL HERITAGE: A CRITICAL DISCOURSE (Fiona Cameron & Sarah Kenderdine eds., 2007).

[57] T.C., *Why Video Games Are So Expensive to Develop*, THE ECONOMIST (Sept. 24, 2014, 11:50 PM), http://www.economist.com/blogs/economist-explains/2014/09/economist-explains-15 [http://perma.cc/Y3K9-5C3Z].

[58] Marcus Cheetham, Pascal Suter, & Lutz Jancke, *The Human Likeness Dimension of the "Uncanny Valley Hypothesis": Behavioral and Functional MRI Findings.* 5 FRONT HUM. NEUROSCI. 126 (2011).

in the recreation. In the Northwest Palace reconstruction video, for example, viewers have no choice about what they see—they must follow the pre-determined path of the "camera" through the landscape.

Technology does offer other, more user-directed alternatives. The same company that created the Northwest Palace video, Learning Sites, Inc., is also working on a larger project to recreate the same site in a virtual reality presentation, where viewers don headsets that simulate three-dimensional vision and allow them to choose which areas to focus on by moving their heads. But the expense of building a virtual world means that the user's choices are still limited—the experience is still heavily determined by the designer's vision of this world. It is more that the user can chose to ignore some content, but cannot so easily envision an alternative interpretation.

Ideally, as some have argued, "[t]he past should be fully viewable and up to the viewer and the viewer alone to choose which pieces of it they [wish] to interpret as they encounter an augmented cultural heritage site in the field or the museum."[59] But this ideal state is impossible to reach (a digital recreation of the "full" past would have to include the entire world, which would be beyond the capacity for a user to experience) or even, really, to approach, given the budget constraints for heritage projects.

3. Absence of Time in Digital Models

Most of the current digital recreations have another type of absence: that of time. While it is possible to allow the viewer to access different images of the same site or monument at different moments in its history, most current digital projects display, at most, the artifact as it exists now and the artifact as the creator of the digital model imagines that it existed when it was first created. This selective choice of time—again, in part, a product of the expense of creating more views of the object through time—leaves out information about the way the object has passed through time and the meanings accreted onto it.

This prioritization of a favored moment is nothing new, of course. Both archeology and the physical restoration of cultural heritage sites frequently involve the actual destruction of the evidence of certain time periods in the process of discovering or preserving other time periods of greater interest to the excavator or restorer. For example, the Athenian Acropolis has been

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59 Falko Kuester et al., *Digital Archaeological Landscapes & Replicated Artifacts: Questions of Analytical & Phenomenological Authenticity & Ethical Policies in CyberArchaeology*, *in* DIGITAL HERITAGE INT'L CONG. (2013).

cleared of all physical signs of its post-Antique occupation, including the remains of the Christian church and Islamic mosque which once, in turn, stood within the ruins of the Parthenon.

4. Absence of Certain Sites in Digital Models

In one of the few articles to examine at length the ethical issues raised when a wealthy country offers to digitize cultural materials (here, the contents of an archive) from a poorer country, Peter Johan Lor & J.J. Britz ask:

> [W]hen materials for developing countries are digitized, are the interests of the holding institution and country taken into account, or is the wealthier party "cherry-picking". . . Who selects the material? Is it primarily material that holds a special interest for the library in the developing country? Does it reflect a European or an American world-view?[60]

These questions must also be asked about the current race to digitize cultural monuments in Syria and Iraq. These projects overwhelmingly focus on pre-Islamic heritage: sites like Palmyra or Nimrud that were created by Romans or the empires of the Ancient Near East. In reality, only a small percentage of the cultural sites destroyed by IS are this ancient. Most of the sites they target are shrines, mosques, churches, cemeteries, and other sacred sites important to Christian, Yazidi, and branches of Islam that IS finds heretical. Unsurprisingly, projects by Syrians and Iraqis to commemorate destroyed heritage include not only ancient sites, but also these more recent monuments, important to living faiths.

Given economic constraints and the many other pressing worries of those who remain in the conflict areas and those who have left, it is not surprising that there are few such initiatives. Those that do exist are inspiring. For example, a number of Syrian artists in the Za'atari refugee camp in Jordan are recreating damaged, destroyed, or unreachable cultural sites using the few materials available to them, which could have included wood, clay, or rocks.[61] One of the most careful of the resulting scale models is that of the Umayyad Mosque of Damascus, considered to be one of the holiest sites of Islam and heavily damaged during the current conflict.[62] But the Za'atari

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60 Peter Johan Lor & J.J. Britz, *An Ethical Perspective on Political-Economic Issues in the Long-Term Preservation of Digital Heritage*, 63 J. AM. SOC'Y FOR INFO. SCI. AND TECH. 2153–64 (2012).

61 *See* Christopher Herwig, *Syria's Landmarks Restored in Miniature,* UNHCR (Aug. 24, 2016, 12:56 PM), http://tracks.unhcr.org/2016/01/syrias-landmarks-restored-in-miniature/ [http://perma.cc/DL89-YWBD].

62 *Id.*

artists are ecumenical: an art teacher and painter named Mahmoud Hariri has built a model of Palmyra from clay and wooden kebab skewers, explaining that his goal is for Za'atari residents to connected with their country and culture: "This is a way for them not to forget."[63]

So far, Western digital preservation projects have not been so broad-ranging. One way of thinking of the appropriate "price" to pay for the right to digitize the Roman site of Palmyra might be the obligation to include other sites, representative of other cultures, in the drive to preserve. Rekrei includes digital models of both pre-Islamic and Islamic objects, but the ratio is still lopsided; as of August 2016, their "3D Gallery" included digital models of thirty-five pre-Islamic objects from Syria and Iraq and only five Islamic objects.[64]

C.   Effects of Absences in Digital Models

There have been a number of discussions by those worried that the digital might "replace" the real—that we will begin to neglect or even discard archeological objects and sites once we have achieved satisfactory simulacra. I believe that such worries are overstated, if only because the technology that would guarantee the satisfaction of our urges to see and touch the real is so far from being developed, especially for three-dimensional objects.[65] Similarly, one could worry that tourists might forgo visiting a cultural site if they can instead access a digital reconstruction, thus causing a loss of tourist revenue for the local community. However, at least in the case of still-existing cultural sites, it is likely that the number of those who decide that they are satisfied by seeing a digital version of the site, and thus do not travel to it, will probably be overbalanced by the number of tourists who decide to visit the site after seeing a digital version.[66]

Rather than worrying about the aura of cultural artifacts, I am worried about their interpretation. Even seemingly simple digital models transmit convincing, unified interpretations of objects, leaving no room for alternate interpretations or even any

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[63] *Id.*

[64] *See Sketchfab Gallery*, REKREI, https://rekrei.org/gallery (last visited Jan. 2, 2017).

[65] The digitization of pure data, as well as two-dimensional objects such as book pages, present different risks. Accordingly, some thinkers have warned that "the 'fattening' of Western repositories" with digitized material from archives in, for example, Africa, could lead to an increase in the isolation and underfunding of these archives, as Western scholars chose to consult the digitized material instead of visiting the archives. PETER LIMB, DIGITAL DILEMMAS AND SOLUTIONS 15 (Chandos Publishing, 2004).

[66] Indeed, I would imagine that the opposite problem is more likely: that sites publicized by high-quality digital reconstructions will see such increased visitorship that their numbers might prove harmful to the preservation of the site.

signal that these alternate interpretations might exist. Compare the experience of visiting the same sites. Visitors to physical heritage sites encounter plenty of evidence of alternate interpretations and uses. They read guidebooks and hear their tour guides and overhear those of others (often offering conflicting information). They read official signage along with the unauthorized graffiti. They get a sense of local attitudes toward the site—is it one that inspires national pride, with hordes of schoolchildren trooping through, or is it one that is little known, with, say, taxi drivers greeting a request to go there with a puzzled expression? Visitors see how sites are really used. Are they protected, gated-off sources of tourist revenue, or are they casually marked by a few faded signposts pointing to a field where shepherds herd their sheep through ancient tombs?

Digital reconstructions can avoid this welter of conflicting attitudes and interpretations. They generally present clean, seamless views of the past—unless the creator makes an effort to change this tendency. Allahyari's "Material Speculation: ISIS" project is an example of a project that attempts to embed alternate viewpoints and interpretations, by including along with the reproduced images of artifacts information and interviews with a wide range of concerned stakeholders.[67] But most digital modeling projects do not go to such lengths.

It could be objected that many digital models, like those made by the Rekrei community, are purely visual, without any associated information at all. But this absence does not prompt the viewer to think about the variety of meanings an object can have. The reverse is true. Absence sends a powerful message: that nothing stands in the way of the viewer's own interpretations of the site.

This interpretive room can be valuable. Who has not increased their empathetic communication with the past by imagining themselves into it, thinking about what their life would have been like had they been born a thousand years ago? But some interpretations have much more sinister effects. Nazi-sponsored archeologists, for example, "discovered" traces of "Aryan" heritage in Poland and other territories, justifying German territorial expansion. Recent decades have seen similar arguments used to amplify territorial claims in Palestine.

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67 *See* discussion, *supra*, at Part II.

IV. LEGAL CONSIDERATIONS FOR DIGITAL MODELS OF CULTURAL HERITAGE

What legal rights are held by those who own (whether individually or under state control) cultural heritage artifacts and those who create digital models of these artifacts? The answers vary slightly from state to state, and there is still some ambiguity in the law where technology has outpaced court decisions, but in general, it seems that the law offers little recourse to those seeking to protest the digitalization of cultural heritage sites, and many protections for those who have done the digitalization.

The cultural heritage objects in question are not protectable by copyright; at thousands of years old, they are in the public domain many times over. An owner could seek to prevent digitalization by restricting access to an artifact, for example, by prohibiting photography by visitors, as many museums do.[68] But this is a moot point once sufficient photographs have been taken to permit 3D modeling, as is true for the Middle Eastern sites and objects examined in this article.

On the other hand, the creators of digital models of these non-copyrightable cultural heritage artifacts most probably do have copyright protection.[69] This does not seem to have been tested in court so far, but is strongly implied by the way courts have read copyright laws and past cases.[70]

In the United States, the two key cases are *Meshwerks v. Toyota* and *Osment Models, Inc. v. Mike's Train House, Inc.* In *Meshwerks v. Toyota*,[71] the plaintiff, which had been commissioned by Toyota's advertising agency to create digital 3D models of several Toyota automobiles for use in an advertising campaign, sued when Toyota used these models in more than the single anticipated ad. Meshworks claimed that this unauthorized use violated the copyright they claimed to hold in the digital models.

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68 *See* Kenneth D. Crews, *Museum Policies and Art Images: Conflicting Objectives and Copyright Overreaching*, 22 FORDHAM INTELL. PROP., MEDIA & ENT. L.J. 796, 797–98 (2012).

69 By contrast, the owner of the copyright in an object such as a Barbie Doll is the only one who can authorize 3D models and 3D-printed replicas of the copyrighted objects, since these models and replicas are considered derivative works and copies under American copyright law. 17 U.S.C. §§ 101, 106 (2012); *see* Charles Cronin, *3D Printing: Cultural Property As Intellectual Property*, 39 COLUM. J.L. & ARTS 1, 31 (2015).

70 For an overview of the issue of the copyrightability of digital models of cultural property in the United States. *See* Cronin, *supra* note 69; *see generally* Thomas Margoni, *The Digitisation of Cultural Heritage: Originality, Derivative Works and (Non) Original Photographs*, UNIV. OF GLASGOW SCH. OF L. (2014) (dealing with a similar overview for the EU).

71 Meshwerks, Inc. v. Toyota Motor Sales U.S.A., Inc., 528 F.3d 1258 (10th Cir. 2008).

The Tenth Circuit determined that Meshwerks's scans were not copyrightable expression and upheld the district court's grant of summary judgment in favor of Toyota.[72] "Originality," not "sweat of the brow," is required for a work to merit copyright protection in the United States.[73] Thus, the fact that Meshwerks employees spent hundreds of hours and drew on high levels of technical skills while rendering a digital wire-frame so that it would exactly copy the automobiles' appearances, worked against Meshwerks's claim to copyright protection. All of the sweat of Meshwerks's brow was dedicated to replicating the originality of another creator. The sole protectable originality in the resulting models was that of Toyota, whose designers created the modeled objects.

However, the Tenth Circuit emphasized that, while Meshwerks's models were not copyrightable, this did not mean that no digital models could ever attain copyright protection: "A Luddite might make the mistake of suggesting that digital modeling, as was once said of photography, allows for nothing more than 'mechanical reproduction' . . . and involves no originality of thought. . . . Clearly, this is not so."[74]

Thus, it is not surprising that, two years after the *Meshwerks* decision, a federal district court in Missouri found that digital 3D models and prints could, in fact, warrant copyright protection.[75] In *Osment Models*, the plaintiff was reproducing railway and filling stations; like cultural heritage artifacts, these were non-copyrightable. Importantly, Osment, unlike the Meshworks employees, was not striving to create exact replicas for his scale models. Instead, he manipulated some of the digital information he worked with, for example by changing some colors and design details, and also added a number of features, such as signage. The court determined that these additions met copyright's requirement for a "spark" of original expression, and thus held that Osment could prevent the unauthorized copying of his models by the defendant, another model railroad producer.[76]

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[72] *Id.* at 1261, 1270.

[73] Feist Publications, Inc. v. Rural Tel. Serv. Co., Inc., 499 U.S. 340, 359–60 (1991); *see also* 17 U.S.C. § 101 *et seq.*; Copyright Act of 1909, § 1 *et seq.*, 35 Stat. 1075; U.S. CONST. art. 1, § 8, cl. 8.

[74] *Meshwerks, Inc.*, 528 F.3d at 1269 (quoting Burrow-Giles Lithograph Co. v. Sarony, 111 U.S. 53, 59 (1884)).

[75] Osment Models, Inc. v. Mike's Train House, Inc., No. 2:09-CV-04189-NKL, 2010 WL 5423740 at *1 (W. Dist. Mo. Dec. 27, 2010).

[76] *Id.* at *7.

Exact photographic reproductions of public domain works of art are not copyrightable.[77] There has been some attempt to argue that at least some digital capture of cultural property is also non-copyrightable because it is merely factual, offering none of the originality that is required for a work to merit copyright protection in the United States and similarly in most other countries.[78] Thus, Brian Wassom, who argued the *Meshwerks* case, believes that the efforts of Rekrei and others to create digital 3D models of cultural heritage are "awesome, impressive, incredibly labor-intensive, highly detailed, and skillful. One thing they are not, however, is copyrightable."[79] That is, they are not copyrightable if these models strive to be exact reproductions without any input from the digital modelers.

But, as Wassom also points out, there are multiple strategies the creators of digital models of cultural heritage can use "for protecting their content, such as making sure to weave fictional imagery into their real-world recreations."[80] Applying the logic of *Osment Models* means that the creator of a digital model of a cultural heritage artifact needs only add a spark of creativity in order to gain copyright protection.

And it is the rare digital model that will not call for this spark. Most digital models involve many decisions about what data to include and what state of the object to recreate, and a project that attempts to restore or recreate an artifact's original appearance will of course require a great deal of creativity. For example, the credits on the Northwest Palace reconstruction video list the names of six people and two institutions for their contributions of "archeological data and interpretation"; one "lead visual artist" and one company for "modeling, rendering, and animation"; and another six people for "additional modeling and texturing."[81] Such a project combines sweat of the brow with originality. Unsurprisingly, the creators of digital models of cultural

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77 Bridgeman Art Library, Ltd. v. Corel Corp., 25 F. Supp. 2d 421 (S.D.N.Y. 1998), on recons., 36 F. Supp. 2d 191 (S.D.N.Y. 1999). However, many U.S. cultural institutions ignore this holding by asserting copyright over their digital photographs of public domain artworks in their collection. Colin T. Cameron, *In Defiance of Bridgeman: Claiming Copyright in Photographic Reproductions of Public Domain Works*, 15 TEX. INTELL. PROP. L.J. 31, 32 (2006).

78 For the argument that digital captures are non-copyrightable, see generally Anne Marie Sullivan, *Cultural Heritage & New Media: A Future for the Past*, 15 J. MARSHALL REV. INTELL. PROP. L. 604, 630 (2016).

79 Brian Wassom, *VR Modeling Has a Lot of Benefits, But Copyright Isn't One of Them*, WASSOM (Aug. 21, 2015), http://www.wassom.com/vr-modeling-has-a-lot-of-benefits-but-copyright-isnt-one-of-them.html [http://perma.cc/95MW-26SH].

80 *Id.*

81 *See Digital Reconstruction of the Northwest Palace, Nimrud, Assyria* (Sept. 18, 2014), http://www.metmuseum.org/metmedia/video/collections/ancient-near-eastern-art/northwest-palace-nimrud [http://perma.cc/FL5X-X7LN].

heritage do claim copyright protection, if only in disclaiming it, as when, for example, Rekrei participants contribute their digital models to the project by granting Creative Commons licensing.[82]

V. CONCLUSION: BEST PRACTICES FOR DIGITAL MODELS OF CULTURAL SITES

The creators of digital models of cultural heritage sites and objects face certain ethical responsibilities, especially given the rights imbalance, whereby the creators have copyright protection for their vision of the past, while the owners of physical cultural heritage do not.

These ethical responsibilities should weigh even more heavily on the creators of digital models of the artifacts destroyed by IS, since this destruction is paired with a refugee crisis. To those forced to flee their homes, the cultural sites that form part of their personal and national identities become yet more precious, and their destruction more painful. And disconnected, dispossessed refugees have little power to contribute to digital reconstruction projects to attempt to shape their interpretations. Digitalization is generally regarded as a solution to problems of access since, for example, someone without the funds to travel to a library can now access digitalized information. But the playing field is not yet entirely level. Not everyone has the connectivity, devices, or language skills required to either access or make a contribution to a digital reconstruction.

One strategy may be to follow Allahyari's example by creating digital models that clearly mark themselves as the product of a modeler rather than attempt to convince the viewer that they are neutral representations of the past. Allahyari's models and prints reproduce stone sculptures in clear resin at a much reduced scale, meaning the viewer cannot mistake them for the originals. Allahyari thus reduces her own authority—she is

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[82] "Creative Commons licensing provides free copyright licenses which allow the copyright owner to dedicate works to the public, or to license certain uses of their works, while retaining and reserving other rights from the proverbial 'copyright bundle of rights;' for themselves or their respective affiliated institutions. Jacobsen v. Katzer, 535 F.3d 1373, 1378 (Fed. Cir. 2008)." Sullivan, *supra* note 78, at 642 n.204. Rekrei users create models and upload them through the website Sketchfab, and then tag them to make them part of the Rekrei community. When a user uploads through Sketchfab, she is presented with a number of options; if she chooses to allow other users to download her model, she is prompted to create a Creative Commons license, and cannot allow downloads unless she does so. *See Help Center*, SKETCHFAB (last updated August 20, 2015), https://help.sketchfab.com/hc/en-us/articles/203020988-Report-Violation [http://perma.cc/688C-ERCU]. The Sketchfab Terms of Use also state that the user remains "the owner of your User Content at all times, and Sketchfab does not claim any ownership rights in your User Content." *Id.*

offering only a version of an original—and the viewer must work to come to his or her own understanding of the object.

Another practice of Allahyari's that should be emulated is her inclusion of information from many sources to accompany her visual models. This could be done even more seamlessly. For example, it is possible to build digital presentation frameworks that allow users to add annotations and comments.[83] This would mean both that scholars specializing in that object or site could update the digitalization to keep pace with new research, but also that others—tourists, locals, anyone—could add their thoughts. The viewer of this type of presentation might be, at times, overwhelmed with debate about particularly controversial aspects of the past, but would always have the sense that he or she is not viewing the past in isolation—that multiple other viewers and interpretations exist.

These interpretations are the true value offered by cultural heritage. Compared to other resources that laws are designed to protect—oil, precious metals, livestock—heritage sites have little inherent value. They offer empty, uninhabitable buildings, graves, and heaps of battered stones. They have value only in relation to how we see them. The past lives only in our imaginations. We must be all the more careful, then, to treat these sites in a manner that does not destroy the value they have for others. We must all work to keep open the many lines of sight on the past.

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[83] *See* Kuester, *supra* note 59.