

HARD DRIVE HERITAGE: DIGITAL CULTURAL PROPERTY IN THE LAW OF ARMED CONFLICT

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ABSTRACT

This Note considers the question of how to protect cultural property in an era of rising cyberwarfare. The Note argues that the law of armed conflict (LOAC)—also referred to as international humanitarian law (IHL)—should apply to protect the three categories of cultural property which cyberwarfare could affect: real-world cultural property, digitized cultural property (cultural property which has been converted into digital form), and digital cultural property (cultural property which has always existed in digital form). Lastly, this Note argues for a novel interpretation of the 1954 Hague Convention for the Protection for Cultural Property that would encompass digital and digitized cultural property.

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INTRODUCTION

Few men have died as nobly as Khaled al-Asaad. He spent his life as the Chief of Antiquities at the historic site of Palmyra in Syria, his hometown, where he protected one of the world's best-preserved archaeological sites—until ISIS seized his home and took him hostage.¹ After a month of torture, the terrorist group publicly beheaded Khaled al-Asaad for refusing to reveal the location of hidden antiquities.² Khaled al-Asaad's sacrifice demonstrates the importance of cultural property to humanity: it is not only a record of humanity, but a fundamental pillar supporting it. Cultural property is so indispensable and so invaluable to humankind that the law must shield it from the bombs and bloodshed of war, just as Khaled al-Asaad did. Yet, one hundred years from now, the artifacts worth dying for will not only be physical but also digital, made of code rather than stone or steel.³ This Note aims to address the fundamental question of how humanity will protect this new form of cultural property during armed conflicts.

There is widespread consensus that the law of armed conflict ("LOAC") applies to state and non-state actors in cyberspace, but there is far less consensus as to exactly how it applies.⁴ The application of settled principles of LOAC to cyber operations is a difficult one, as the cyber domain

1. Ben Hubbard, *Syrian Expert Who Shielded Palmyra Antiquities Meets a Grisly Death at ISIS' Hands*, N.Y. TIMES (Aug. 19, 2015), <https://www.nytimes.com/2015/08/20/world/middleeast/isis-palmyra-syria-antiquities-scholar-beheaded.html> (on file with the *Columbia Human Rights Law Review*).

2. *Id.*

3. U.N. Educ., Sci. and Cultural Org. [UNESCO], *Charter on the Preservation of Digital Heritage*, at pmb1, CL/3865, (Oct. 2, 2003), <https://unesdoc.unesco.org/ark:/48223/pf0000179529.page=2> [<https://perma.cc/LK83-5DPG>] ("Recognizing that such resources of information and creative expression are increasingly produced, distributed, accessed and maintained in digital form, creating a new legacy—the digital heritage . . .").

4. Harold Koh, Legal Advisor, U.S. State Dep't, *International Law in Cyberspace: Remarks at U.S. CYBERCOM Inter-Agency Legal Conference* (Sept. 18, 2012); Gary D. Solis, *Cyber Warfare*, 219 MIL. L. REV. 1, 2 (2014); MICHAEL N. SCHMITT, *The Law of Armed Conflict Generally*, in TALLINN MANUAL 2.0 ON THE INTERNATIONAL LAW APPLICABLE TO CYBER OPERATIONS 375, 375 (2017) [hereinafter TALLINN MANUAL 2.0]; MINISTÈRE DES ARMÉES, INTERNATIONAL LAW APPLIED TO OPERATIONS IN CYBERSPACE (2019), <https://www.defense.gouv.fr/content/download/567648/9770527/file/international+law+applied+to+operations+in+cyberspace.pdf> [<https://perma.cc/W2CZ-VQYW>] (outlining the French position on international law in cyberspace and clarifying when cyber operations amount to an armed attack); MINISTER OF FOREIGN AFFAIRS, LETTER TO PARLIAMENT ON THE INTERNATIONAL LEGAL ORDER IN CYBERSPACE (July 5, 2019), <https://www.government.nl/ministries/ministryofforeignaffairs/documents/parliamentary-documents/2019/09/26/letter-to-the-parliament-on-the-international-legal-order-in-cyberspace> [<https://perma.cc/G5EV-YLUS>] (elucidating the Netherlands' views on non-intervention, sovereignty, and international humanitarian law in cyberspace).

lacks the physical characteristics which have always marked battlefields.⁵ This has resulted in a great deal of literature discussing how the principles of proportionality,⁶ distinction,⁷ attribution,⁸ and neutrality⁹ can exist in cyberspace. The current intricacies of global politics have also complicated matters, as norms and interpretations of international law in cyberspace are continuously evolving to match shifting political and technical realities.¹⁰ This interpretive uncertainty has raised the question of how protection for cultural property under LOAC, a longstanding goal of international law, can extend to cyberspace.

Cultural property is protected under both treaty-based and customary international law. The destruction, degradation, theft, vandalism, or misappropriation of cultural property is a war crime.¹¹ International law

5. OFF. OF GEN. COUNS., DEP'T OF DEF., LAW OF WAR MANUAL 1, 1014 (2016), <https://dod.defense.gov/Portals/1/Documents/pubs/DoD%20Law%20of%20War%20Manual%20-%20June%202015%20Updated%20Dec%202016.pdf> [<https://perma.cc/2ZSL-ZLPB>] (“Cyber operations may pose challenging legal questions because of the variety of effects they can produce.”) [hereinafter Department of Defense].

6. Hensey A. Fenton, III, Note, *Proportionality and its Applicability in the Realm of Cyber-Attacks*, 29 DUKE J. COMP. & INT'L L. 335 (2019).

7. Elizabeth Mavropoulou, *Targeting in the Cyber Domain: Legal Challenges Arising from the Application of the Principle of Distinction to Cyber Attacks*, 4 J.L. & CYBER WARFARE 23, 23 (2015).

8. Delbert Tran, Note, *The Law of Attribution: Rules for Attributing the Source of a Cyber-Attack*, 20 YALE J. L. & TECH. 376, 376 (2018).

9. Oona A. Hathaway et al., *The Law of Cyber-Attack*, 100 CALIF. L. REV. 817, 856 (“Certain characteristics of cyber-attacks make the evaluation of the principle of neutrality unusually complex.”).

10. Michael N. Schmitt, *Taming the Lawless Void: Tracking the Evolution of International Law Rules for Cyberspace*, 3 TEX. NAT'L SEC. REV. 32, 34 (2020) [hereinafter Schmitt, *Taming the Lawless Void*]; Michael N. Schmitt, *The Law of Cyber Warfare: Quo Vadis?*, 25 STAN. L. & POL'Y REV. 269, 271 (2014) [hereinafter Schmitt, *The Law of Cyber Warfare*]; Department of Defense, *supra* note 5, at 1011 (“Precisely how the law of war applies to cyber operations is not well-settled, and aspects of the law in this area are likely to continue to develop, especially as new cyber capabilities are developed and States determine their views in response to such developments.”).

11. Roger O'Keefe, *Protection of Cultural Property Under International Criminal Law*, 11 MELBOURNE J. INT'L L. 339, 358 (2010) (citing the 1954 Hague Convention and its Additional Protocols, the Rome Statute, and Additional Protocols I and II to the Geneva Convention, as well as ICTY prosecutions and the Nuremburg Tribunals). For an extensive list of states which protect cultural property in their military manuals or domestic legislation, see INT'L COMM. RED CROSS, *Practice Relating to Rule 38. Attacks Against Cultural Property*, https://ihl-databases.icrc.org/customaryihl/eng/docs/v2_rul_rule38 [<https://perma.cc/X328-NPLR>]. See also Rome Statute of the International Criminal Court, art. 8, 2(b), *opened for signature* July 17, 1998, 2187 U.N.T.S. 90 (entered into force July 1, 2002) (designating “[i]ntentionally directing attacks against buildings dedicated to religion, education, art, science or charitable purposes, historic monuments, hospitals and places where the sick and wounded are collected, provided they are not

is clear on this matter, with protection for cultural property being a long-standing international legal principle.¹² However, the emergence of the internet and the growth of digital technologies have revolutionized traditional forms of cultural property—such as monuments, holy sites, and archaeological digs—and digitized forms of cultural property. This emergence also created a new form: digital cultural property, which is sometimes termed “born-digital cultural heritage.”¹³ Just as culture has become increasingly digital, so too has warfare, with large numbers of state and non-state actors fielding substantial cyber capabilities.¹⁴ This shift must prompt a reevaluation of the long-standing protections for cultural property in LOAC, which was made to protect columns and arches, not ones and zeroes. Not only are digitized and digital cultural property vulnerable to

military objectives” a war crime). The Second Protocol to the Hague Convention of 1954, created in 1999, also requires states to conduct domestic prosecutions of serious violations of the 1954 Hague Convention. Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict, art. 15, 17, Mar. 26, 1999, 2253 U.N.T.S. 172, http://portal.unesco.org/en/ev.php-URL_ID=15207&URL_DO=DO_TOPIC&URL_SECTION=201.html [<https://perma.cc/4VKW-B9KC>]. The International Criminal Tribunal for the former Yugoslavia successfully prosecuted several combatants for the destruction of cultural property, religious institutions, and institutions dedicated to education. Prosecutor v. Jokić, Case No. IT-01-42/1-S, Sentencing Judgement, ¶¶ 54–56 (Int’l Crim. Trib. for the Former Yugoslavia Mar. 18, 2004); Prosecutor v. Prlić, et al., Case No. IT-04-74-T, Judgement, ¶¶ 171–178 (Int’l Crim. Trib. for the Former Yugoslavia May 29, 2013); Prosecutor v. Strugar, Case No. IT-01-42-A, Judgement, ¶¶ 277–280 (Int’l Crim. Trib. for the Former Yugoslavia July 17, 2008). For a discussion of whether international criminal law should consider the civilian use of cultural property or its cultural value, see Micaela Frulli, *The Criminalization of Offences Against Cultural Heritage in Times of Armed Conflict: The Quest for Consistency*, 22 EUR. J. INT’L L. 203 (2011).

12. ROGER O’KEEFE ET AL., PROTECTION OF CULTURAL PROPERTY: MILITARY MANUAL §§ 7–33 (2016), <https://unesdoc.unesco.org/ark:/48223/pf0000246633> [<https://perma.cc/S74T-P3R5>] (laying out cultural property’s protections in multilateral treaties, customary international law, international criminal law, international human rights law, and United Nations Security Council resolutions).

13. UNESCO, *supra* note 3.

14. INT’L INST. FOR STRATEGIC STUD., THE MILITARY BALANCE 2020 515–518 (2020), <https://www.iiss.org/publications/the-military-balance/military-balance-2020-book/military-cyber-capabilities> [<https://perma.cc/XGF8-FYKG>]; JULIA VOO ET AL., NATIONAL CYBER POWER INDEX 2020 11 (2020), <https://www.belfercenter.org/publication/national-cyber-power-index-2020> [<https://perma.cc/KW7L-5LXV>]; PUB-PRIV. ANALYTIC EXCH. PROGRAM, COMMODIFICATION OF CYBER CAPABILITIES: A GRAND CYBER ARMS BAZAAR 2 (2019), https://www.dhs.gov/sites/default/files/publications/ia/ia_geopolitical-impact-cyber-threats-nation-state-actors.pdf [<https://perma.cc/5VDD-RXR8>] (“Non-state actors, such as cyber criminals, exploit an increasingly interconnected environment to mount sophisticated cyber operations that can yield vast sums from targeted financial institutions or from large scale ransomware campaigns against smaller targets.”).

conventional warfare, but cyber warfare also poses a threat to this new form of human culture.

The law of armed conflict should extend to protect the three categories of cultural property which cyber warfare could affect: real-world cultural property, digitized cultural property, which is cultural property that has been converted into a digital form, and digital cultural property, which is cultural property that has always existed in a digital form.¹⁵ This Note proposes a novel interpretation of existing legal instruments to extend significant protection under international humanitarian law (“IHL”)¹⁶ for both digital and digitized cultural property. This paper then contends that digital and digitized cultural property should be categorized as archives and

15. The specialized terminology surrounding this topic deserves clarification. It is worth clarifying the terms “cultural property” and “cultural heritage.” The two terms are almost always used interchangeably in international treaties and scholarship. While cultural property is an older term, it has largely been superseded by cultural heritage, which is conceptually oriented around preservation for future generations rather than the rights and powers of the possessor. The term cultural heritage also encompasses practices that do not fall within any definition of tangible or intangible cultural heritage, making it a broader category than cultural property, although the terms are often synonymous. For example, the Great Wall of China is cultural property that forms part of China’s cultural heritage. Yet the practice of Chinese calligraphy, an intangible cultural tradition, is not cultural property despite being part of China’s cultural heritage. However, unlike cultural heritage, cultural property has a clear legal meaning, defined in the 1954 Hague Convention and 1970 UNESCO Convention. See Lyndel Prott & Patrick O’Keefe, ‘*Cultural Heritage*’ or ‘*Cultural Property*’?, 1 INT’L J. CULTURAL PROPERTY 307, 309 (1992); Manlio Frigo, *Cultural Property v. Cultural Heritage: A “Battle of Concepts” in International Law?*, 86 INT’L REV. RED CROSS 367, 367 (2004); Janet Blake, *On defining the cultural heritage*, 49 INT’L & COMPAR. L. Q. 61, 65(2000).

Digitized cultural property is cultural property that has been copied or converted into digital format, yet which came from a real-world copy. Common examples of digitized cultural property include scanned books, audio recordings of music or culturally significant stories, and 3D renderings of monuments and artifacts.

Digital cultural property is cultural property that has no original physical or real-world copy. Common examples of digital cultural property include digital artwork, blogs, vlogs, webcomics, e-books, certain audio recordings that are only digital downloads, some television shows and films, some journalism, and any other content that exists solely in digital form. The line between digital and digitized cultural property is not always clear. Take JSTOR, which is a digital repository for academic research similar to SSRN or PubMed. JSTOR hosts 12 million academic journal articles, books, and primary sources, yet only some lack any original physical version. See *About JSTOR*, JSTOR, <https://about.jstor.org/> [<https://perma.cc/FZN7-TT2U>].

16. International humanitarian law (“IHL”) is “broadly speaking, that branch of public international law that seeks to moderate the conduct of armed conflict and to mitigate the suffering that it causes.” Amanda Alexander, *A Short History of International Humanitarian Law*, 26 EUR. J. INT’L L. 109, 111 (2015). IHL, which is synonymous with the law of armed conflict, encompasses treaties on the rules of war, *ius in bello*, as well as international norms that have ossified into binding customary international law. *Id.*

repositories under international law. This would bring digital and digitized cultural property within treaty-based definitions of protected cultural property during times of armed conflict. As states increasingly turn to digitization to protect cultural property from the threats of climate change, terrorism, and physical degradation, and as human culture becomes increasingly digital, these protections will become increasingly important.¹⁷ Because LOAC's rules on cultural property and heritage do not vary substantially between international and non-international armed conflicts involving non-state actors,¹⁸ this paper's arguments extend to both. However, for simplicity's sake, this Note will focus on how to protect digital and digitized cultural property in international armed conflicts.¹⁹ Part I

17. Alonzo C. Addison, *The Vanishing Virtual: Safeguarding Heritage's Endangers Digital Record*, in *NEW HERITAGE: NEW MEDIA AND CULTURAL HERITAGE* 27, 28–29 (Yehuda E. Kalay et al. eds., 2008) (describing how technological development in computer-aided design, laser scanning, and photogrammetric cameras have created a “rush to the virtual” both for preservation and dissemination); Neil Silberman, *From Cultural Property to Cultural Data: The Multiple Dimensions of “Ownership” in a Global Digital Age*, 21 *INT'L J. CULTURAL PROP.* 365, 376 (2014) (“In cases where the originals are threatened with destruction by the relentless forces of racism, fundamentalism, decay, urbanization, pollution, or climate change, digital technologies in the form of real-time monitors of changes in the physical condition of cultural property and sites can assist in its preservation . . .”). UNESCO has provided a standard list of threats affecting world heritage, which includes pollution, invasive species, various natural disasters, war, looting and climate change, among others. *List of Factors Affecting the Properties*, UNESCO WORLD HERITAGE CONVENTION, <http://whc.unesco.org/en/factors/> [<https://perma.cc/8WXT-WHAF>].

18. The Rome Statute's provisions on cultural property extend to both international and non-international armed conflicts, as does the 1954 Hague Convention and principles of customary international law. 1 JEAN-MARIE HENCKAERTS & LOUISE DOSWALD-BECK, *INT'L COMM. RED CROSS, CUSTOMARY INTERNATIONAL HUMANITARIAN LAW*, Rule 38–41 (2005), https://ihl-databases.icrc.org/customary-ihl/eng/docs/v1_rul_rule38#reFn_49A07214_00001 [<https://perma.cc/EHN2-XKL6>]. Ratified in 1999, the Second Additional Protocol to the 1954 Hague Convention explicitly extended the 1954 Hague Convention to non-state actors involved in non-international armed conflicts. Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict, The Hague, Mar. 26, 1999, UNESCO Doc. HC/1999/7, <https://ihl-databases.icrc.org/ihl/INTRO/590> [<https://perma.cc/PH9D-TPFM>].

19. While international armed conflicts occur between states, non-international armed conflicts involve “protracted armed violence between governmental authorities and organized armed groups or between groups within a State.” Anne-Marie Carstens, *The Hostilities-Occupation Dichotomy and Cultural Property in Non-International Armed Conflicts*, 52 *STAN. J INT'L L.* 1, 4 (2016) (quoting *Prosecutor v. Tadić*, Case No. IT-94-1-I, Decision on Defence Motion for Interlocutory Appeal on Jurisdiction, ¶ 70 (Int'l Crim. Trib. For the Former Yugoslavia Oct. 2, 1995)). The vast majority of armed conflicts today, especially those resulting in damage to physical cultural property, are non-international, where a more limited version of IHL applies. *Id.* The differences in IHL between international and non-international armed conflicts are hotly debated and uncertain,

begins by exploring the history of protections for cultural property and heritage in times of war, with particular emphasis on the reasons for such protections. Part II discusses the development of digital and digitized cultural property and current threats to digital cultural heritage. Part III proposes a novel interpretation of digital and digitized cultural property as historically significant archives or documents and addresses what obligations belligerents ought to have towards cultural property in cyberspace.

I. Place of Cultural Property in the Law of Armed Conflict

A. Development of Protections for Cultural Property

With some exceptions, the wanton destruction of cultural property and heritage in ancient and medieval warfare was commonplace, governed by the maxim “to the victor go the spoils.”²⁰ Athenian historian Xenophon wrote, “It is an eternal law the wide world over, that when a city is taken in war, the citizens, their persons, and all their property fall into the hands of the conquerors.”²¹ The Roman Triumph prominently featured stolen art from defeated enemies,²² the Bible repeatedly references the plundering of art and treasures as spoils of war,²³ and when the Mongols sacked Baghdad in 1258 and destroyed the city’s great libraries, they threw so many books

especially in cyber space. David Wallace & Christopher Jacobs, *Conflict Classification and Cyber Operations: Gaps, Ambiguities and Fault Lines*, 40 U. PA. J. INT’L L. 643, 652 (2019); Michael Schmitt & Sean Watts, *Beyond State-Centrism: International Law and Non-State Actors in Cyberspace*, 21 J. CONFLICT SEC. L. 595, 611 (2016) (“In many respects, the state-centric legal regime of public international law may seem ill-suited or even inadequate to address the challenges the super-empowered non-state actors of cyberspace present.”). However, because state actors possess the most substantial capabilities in cyberspace and because IHL speaks with greater clarity on international armed conflicts, this paper focuses on international armed conflicts.

20. Or, as more eloquently phrased by Thucydides, “right, as the world goes, is only in question between equals in power, while the strong do what they can and the weak suffer what they must.” THUCYDIDES, *HISTORY OF THE PELOPONNESIAN WAR 566–67* (Richard Crawley trans., Floating Press 2008) (Fourth century BCE).

21. XENOPHON, *CYROPAEDIA*, at book VII, ch. 5, l. 73 (F.M. Stawell ed., Henry Graham Dakyns trans., Project Gutenberg 2009) (370 BCE) (ebook).

22. MARY BEARD, *THE ROMAN TRIUMPH* 159 (2009).

23. *Jeremiah* 15:13 (King James) (“Thy substance and thy treasures will I give to the spoil without price, and that for all thy sins, even in all thy borders.”); *2 Chronicles* 14:13-14 (“And Asa and the people that were with him pursued them unto Gerar . . . and they carried away very much spoil. And they smote all the cities round about Gerar . . . and they spoiled all the cities; for there was exceeding much spoil in them.”); *see also Deuteronomy* 20:10 (elaborating the practices of war and articulating divine endorsement of expropriating cultural property).

into the Tigris that “they formed a bridge that would support men on horseback” and apocryphally turned the river black with ink.²⁴ During the sack of Constantinople in the Fourth Crusade, “the palaces were burnt. The accumulated treasures of antiquity were recklessly looted and destroyed . . . The libraries containing the assembled literature of the classical and early Christian ages, went up in flames.”²⁵ These are minor examples of the countless works of art, architecture, and literature that became casualties of war.²⁶

Yet some ancient thinkers and commanders took steps to exempt art, architecture, and houses of worship from the rampant destruction of civilian property. Greek historian Polybius wrote that while the destruction or taking of civilian property “are necessary acts according to the laws and rights of war; to deface temples, statues, and such like erections in pure wantonness . . . must be regarded as an act of blind passion and insanity.”²⁷ Cicero later used this line of reasoning to prosecute Gaius Verres in 70 BCE for expropriating artworks from temples and citizens during his governorship of Sicily.²⁸ To mitigate the damage of war to spiritual institutions, Frederick Barbarossa issued an edict in 1158 forbidding the pillaging of churches, although the ransacking of houses of worship remained ubiquitous in medieval warfare.²⁹ The Quran likewise prohibits fighting in sacred places, such as mosques and other houses of worship.³⁰

The Enlightenment marked a substantial shift in the treatment of cultural property and heritage in international legal thought.³¹ French jurist Emer de Vattel wrote that destroying cultural property renders a belligerent

24. MICHAEL HARRIS, 4 HISTORY OF LIBRARIES IN THE WESTERN WORLD 77 (1984); James Raven, *Introduction: The Resonances of Loss*, in LOST LIBRARIES: THE DESTRUCTION OF GREAT BOOK COLLECTIONS SINCE ANTIQUITY 1, 2–11 (James Raven ed., 2004).

25. G.B. Smith, *Islam and Christendom*, in HISTORY OF THE WORLD 339, 440–41 (2nd ed., W.N. Weech ed., 1959).

26. It is estimated that as little as 1% of ancient Greek literature survived to the present day, although some estimates range as high as 7%. RUDOLF BLUM, KALLIMACHOS: THE ALEXANDRIAN LIBRARY AND THE ORIGINS OF BIBLIOGRAPHY 8, 13 n.34 (1991).

27. POLYBIUS, THE HISTORIES 369 (Evelyn Shuckburgh trans., MacMillan & Co. 1889).

28. Margaret Miles, *Cicero's Prosecution of Gaius Verres: A Roman View of the Ethics of Acquisition of Art*, 11 INT'L J. CULTURAL PROP. 28, 28 (2002).

29. JIRI TOMAN, THE PROTECTION OF CULTURAL PROPERTY IN THE EVENT OF ARMED CONFLICT 4 (1996).

30. QURAN 2:191 (“And kill them wherever you find them . . . and persecution is severer than slaughter, and do not fight with them at the Sacred Mosque until they fight with you in it, but if they do fight you, then slay them . . .”).

31. Joshua Kastenberg, *The Legal Regime for Protecting Cultural Property During Armed Conflict*, 42 AIR FORCE L. REV. 277, 282 (1997), https://digitalrepository.unm.edu/cgi/viewcontent.cgi?article=1423&context=law_facultyscholarship [<https://perma.cc/7VTL-XVRY>].

an enemy to all mankind and that “the wanton destruction of public monuments, temples, tombs, statues, paintings, &c. [*sic*] is absolutely condemned, even by the voluntary law of nations, as never being conducive to the lawful object of war.”³² Reasoning that no party would gain from the destruction of cultural property, Vattel argued such destruction or expropriation was unlawful.³³ This protection complemented Vattel’s principle of moderation in warfare, especially regarding pillaging hostile territory. “All damage done to the enemy unnecessarily, every act of hostility which does not tend to procure victory and bring the war to a conclusion, is licentiousness condemned by the laws of nature.”³⁴ Drawing on Cicero and Polybius, influential Dutch jurist Hugo Grotius similarly argued for protecting cultural property under the laws of war. “Porticos, Temples, statues, and all other elegant works and monuments of art” are “of such a nature, as to contribute, no way, to the support and prolongation of war.”³⁵ As a result, Grotius thought belligerents ought to exercise moderation in their treatment of enemy civilian property generally and cultural property in particular.³⁶

Regardless, it would take the arrival of industrialized warfare to transform legal theory into legal agreements. The nineteenth century saw further refinement of the laws of war and its provisions concerning cultural property. The 1863 Lieber Code, a set of instructions issued to Union soldiers during the American Civil War, provided that “[c]lassical works of art, libraries, scientific collections, or precious instruments, such as astronomical telescopes, as well as hospitals, must be secured against all avoidable injury, even when they are contained in fortified places whilst besieged or bombarded.”³⁷ But the Lieber Code’s protection for such cultural property was limited at best; it also allowed for the seizure of cultural property by an invading or occupying force if it could remove cultural property without injury, with the determination of ownership left to the final peace conference.³⁸ Although it was not intended as a legal agreement, the Lieber Code nevertheless had an immense influence on the development of the laws

32. EMER DE VATTEL, *THE LAW OF NATIONS* 370 (London, G. G. & J. Robinson, 1797).

33. *Id.* at 368.

34. *Id.* at 369.

35. HUGO GROTIUS, *THE RIGHTS OF WAR AND PEACE* 367 (A.C. Campbell trans., Project Gutenberg 2014) (ebook), <https://www.gutenberg.org/files/46564/46564-h/46564-h.htm> [<https://perma.cc/K85G-9UUQ>].

36. *Id.*

37. War Dept., General Orders No. 100: The Lieber Code, Instructions for the Government of Armies of the United States in the Field, Art. 35 (1863), https://avalon.law.yale.edu/19th_century/lieber.asp#art35 [<https://perma.cc/DS67-EXGX>].

38. *Id.* at art. 36.

of war.³⁹ France, Germany, Britain, and other European powers adopted similar service regulations in the ensuing decades.⁴⁰ The 1874 Brussels Declaration, a non-binding precursor to the Hague Conventions, provided that the destruction of “historic monuments, works of art and science, should be made the subject of legal proceedings by the competent authorities.”⁴¹ The Brussels Declaration also created a distinctive symbol to be affixed to protected cultural property to give notice to belligerents of the building’s legal status, a key idea in later treaties.⁴²

By the twentieth century, foundational international treaties on the laws of war began to give greater force to protections for cultural property. Article 56 of the 1907 Hague Convention states that, during an occupation, “[t]he property of municipalities, that of institutions dedicated to religion, charity and education, the arts and sciences, even when State property, shall be treated as private property.”⁴³ The treaty further mandates that “[a]ll seizure of, destruction or wilful [*sic*] damage done to institutions of this character, historic monuments, works of art and science, is forbidden, and should be made the subject of legal proceedings.”⁴⁴ Article 27 also requires that “all necessary steps must be taken to spare, as far as possible, buildings dedicated to religion, art, science, or charitable purposes, [and] historic monuments” and states that belligerents have a duty to clearly demarcate protected buildings or property.⁴⁵ However, the 1907 treaty proved ineffective at protecting cultural property during the Second World War, as Axis forces blatantly disregarded it.⁴⁶ The extensive looting of cultural

39. See JOHN FABIAN WITT, *LINCOLN’S CODE: THE LAWS OF WAR IN AMERICAN HISTORY* 139-70 (2012) (tracing the impact of the Lieber Code on world affairs after the Civil War).

40. TOMAN, *supra* note 29, at 7.

41. *Id.* at 9.

42. *Id.*

43. Convention Respecting the Laws and Customs of War on Land, art. 56, Oct. 18, 1907, 36 Stat. 2277 [hereinafter 1907 Hague Convention].

44. *Id.* This provision of the treaty is still relevant; in 2004, the Eritrea-Ethiopia Claims Commission found that Ethiopian forces deliberately felled the Stela of Matara, a 2,500-year-old obelisk of great cultural importance. The Commission held that the destruction of the Stela was a violation of customary international law and Article 56 of the Hague Regulations. XXVI U.N. Reports of International Arbitral Awards 148-50 (2004), https://legal.un.org/riaa/cases/vol_XXVI/115-153.pdf [<https://perma.cc/Z4VC-X4F4>].

45. 1907 Hague Convention, *supra* note 43, at art. 27.

46. TOMAN, *supra* note 29, at 20. The destruction of cultural property in World War II is a fraught topic. Allied bombing campaigns obliterated important cultural sites in Germany and Japan, such as Hiroshima Castle and Dresden Cathedral. SIEGFRIED ENDERS & NEILS GUTSCHOW, *HOZON: ARCHITECTURAL AND URBAN CONSERVATION IN JAPAN* 12 (1998) (describing how U.S. bombing destroyed 206 culturally designated sites in Japan); Rachel Martin, *Dresden Church Reopened After World War II Destruction*, NPR (Oct. 31, 2005), <https://www.npr.org/templates/story/story.php?storyId=4982374> [<https://perma.cc/3346-E7Q3>]; Ran Zwigenberg, *Hiroshima Castle and the Long Shadow*

treasures by the Nazi regime led to the creation of the 1954 Convention for the Protection of Cultural Property in the Event of Armed Conflict (“1954 Hague Convention”).⁴⁷

B. Hague Convention, Additional Protocols, and the Evolution of Cultural Property Protections

The 1954 Hague Convention is a core treaty shielding cultural property in armed conflicts. It aims to prevent “damage to cultural property belonging to any people whatsoever...since each people makes its contribution to the culture of the world.”⁴⁸ The 1954 Convention, faced with “the developments in the technique of warfare” which exacerbated the dangers posed to cultural property, built on the 1907 framework by requiring states to secure cultural property during peacetime and prohibiting the destruction of cultural heritage witnessed in World War II.⁴⁹ The treaty defines cultural property as “movable or immovable property of great importance to the cultural heritage of every people.”⁵⁰ This includes,

of Militarism in Postwar Japan, 33 JAPAN REV. 195. 195 (2019). However, the Nazi’s systematic campaign of looting and eradicating important cultural works was so extensive it resulted in charges at the Nuremberg Tribunal and led Allied forces to establish the Monuments, Fine Arts, and Archives Program (also referred to as the “Monuments Men”) to safeguard plundered cultural works. Sanja Zgonjanin, *The Prosecution of War Crimes for the Destruction of Libraries and Archives During Times of Armed Conflict*, 40 LIBR. & CULTURE 128, 133–35 (2005); see generally ROBERT EDSSEL & BRETT WITTER, *THE MONUMENTS MEN: ALLIED HEROES, NAZI THIEVES, AND THE GREATEST TREASURE HUNT IN HISTORY* (2009).

47. GARY SOLIS, *LAW OF ARMED CONFLICT: INTERNATIONAL HUMANITARIAN LAW IN WAR* 559 (2010).

48. The 1954 Hague Convention’s approach is highly internationalist in that it frames cultural property as being of great significance to humanity regardless of location or national jurisdiction. See John Merryman, *Two Ways of Thinking About Cultural Property*, 80 AM. J. INT’L L. 831, 836 (1986). The Convention’s preamble states “that damage to cultural property belonging to any people whatsoever means damage to the cultural heritage of all mankind, since each people makes its contribution to the culture of the world.” Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict pmbl., May 14, 1954, S. Treaty Doc. 106-1, 249 U.N.T.S. 216, http://portal.unesco.org/en/ev.php-URL_ID=13637&URL_DO=DO_TOPIC&URL_SECTION=201.html [https://perma.cc/WGZ9-PCAM] [hereinafter 1954 Hague Convention]. As a result, the Convention protects the cultural property “of each respective people” rather than property “of all peoples jointly,” an interpretation which the parties’ implementation reports support. ROGER O’KEEFE, *THE PROTECTION OF CULTURAL PROPERTY IN ARMED CONFLICT* 104–05 (2006). This interpretation is significant as it expands the scope of the treaty beyond cultural property of global significance and protects each people’s distinct cultural heritage.

49. 1954 Hague Convention, *supra* note 48, at pmbl. As of now, the Convention has 133 state parties.

50. *Id.*

but is not limited to, “monuments of architecture, art or history, whether religious or secular . . . works of art; manuscripts, books and other objects of artistic, historical or archaeological interest; as well as scientific collections and important collections of books or archives or of reproductions of the property defined above.”⁵¹ The Convention also protects buildings which preserve or exhibit protected movable cultural property, “such as museums, large libraries and depositories of archives, and refuges intended to shelter” cultural property in an armed conflict.⁵²

The Convention clearly defines the scope of its protection, but there is no objective test for determining which monuments, buildings, or manuscripts IHL protects. The party in whose territory the property is situated determines its cultural importance, and thus whether it is legally protected—a determination which parties must make in good faith.⁵³ Absent notice to opposing parties under Articles 3 and 6 of the Hague Convention—notice that is left up to the parties’ discretion—belligerents must hazard an educated guess, weighed down with caution, as to any item’s cultural importance.⁵⁴ Belligerents must then “respect cultural property” by refraining from conduct that would expose it to destruction or damage and further have a duty to protect cultural property from vandalism, theft, or

51. *Id.* at art. 1.

52. *Id.* at pmb.; *see also* Roger O’Keefe, *The Meaning of ‘Cultural Property’ Under the 1954 Hague Convention*, 46 NETH. INT’L L. REV. 26, 26–56, (1999). It is worth noting that the United States, upon signing the 1954 Hague Convention, added a reservation that “the rules established by the Convention apply only to conventional weapons, and are without prejudice to the rules of international law governing other types of weapons, including nuclear weapons.” Thus, it is far from clear that the United States would apply this treaty to cyber space. Hague Convention, S. TREATY DOC. NO. 106-1(A) (2008); *see also* Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I) art. 53, 8 June 1977, 1125 U.N.T.S. 3 (“[I]t is prohibited: (a) to commit any acts of hostility directed against the historic monuments, works of art or places of worship which constitute the cultural or spiritual heritage of peoples; (b) to use such objects in support of the military effort.”).

The other commonly used definition of cultural property in international law comes from the Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property of 1970, often referred to as the UNESCO Convention. That treaty defines cultural property with greater specificity and more expansively than the 1954 Convention, and, like the 1954 Convention, defers to parties’ respective views of cultural importance. *See* Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property, art. 1, Nov. 14 1970, 823 U.N.T.S. 231, http://portal.unesco.org/en/ev.php-URL_ID=13039&URL_DO=DO_TOPIC&URL_SECTION=201.html [<https://perma.cc/D53M-BHZK>].

53. O’KEEFE, *supra* note 48, at 109; *see also* Vienna Convention on the Law of Treaties, art. 26–32, May 23, 1969, 1155 U.N.T.S. 331 (discussing the determination for legal protection).

54. O’KEEFE, *supra* note 48, at 111.

misappropriation.⁵⁵ Likewise, belligerents are forbidden from directing reprisals toward cultural property and from requisitioning it.⁵⁶

The adoption of Additional Protocols I and II to the 1949 Geneva Conventions in 1977 bolstered the 1954 Hague Convention and provided additional protections for cultural heritage.⁵⁷ In both international and non-international armed conflicts, these protocols prohibit “acts of hostility directed against the historic monuments, works of art or places of worship which constitute the cultural or spiritual heritage of peoples.”⁵⁸ The Additional Protocols to the Geneva Convention refer to objects which “constitute the cultural or spiritual heritage of peoples.” This is different than the Hague Convention’s protections for property which apply when an object is “of great importance to the cultural heritage.” However, the International Committee of the Red Cross (“ICRC”) has clarified that “the basic idea is the same.” The Additional Protocols cover “objects whose value transcends geographical boundaries, and which are unique in character and are intimately associated with the history and culture of a people.”⁵⁹

In addition to the aforementioned treaties, customary international law also protects cultural property. The International Committee of the Red Cross lists respect for cultural property during armed conflict as part of customary international law.⁶⁰ Belligerents are prohibited from using cultural property for military purposes except when required by military

55. 1954 Hague Convention, *supra* note 48, at art. 4.

56. *Id.*

57. The Additional Protocols were adopted “[w]ithout prejudice to the provisions of The Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict of 14 May 1954 . . .” Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I) art. 53, June 8, 1977, 1125 U.N.T.S. 3, 27 (entered into force Dec. 7, 1978) [hereinafter Additional Protocol I]; Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II) art. 16, June 8, 1977, 1125 U.N.T.S. 609, 616 (entered into force Dec. 7, 1978) [hereinafter Additional Protocol II].

58. Additional Protocol I, *supra* note 57, at 27; Additional Protocol II, *supra* note 57, at 616.

59. Int’l Comm. Red Cross, Commentary to Additional Protocol I to the Geneva Convention, ¶ 2064 (1987), <https://ihldatabases.icrc.org/applic/ihl/ihl.nsf/Comment.xsp?action=openDocument&documentId=501D619BA5E17158C12563CD00434AF5> [https://perma.cc/G48W-79AW].

60. HENCKAERTS & DOSWALD-BECK, *supra* note 18, at Rule 38 (stating that “[p]roperty of great importance to the cultural heritage of every people must not be the object of attack unless imperatively required by military necessity,” based on the International Committee of the Red Cross’s view of extensive state practice and several widely agreed-upon multilateral treaties).

necessity.⁶¹ Customary international law likewise prohibits the theft, seizure, or willful damage of cultural property and requires that occupying powers prevent the illicit export of cultural property from occupied territory.⁶² These well-settled principles of international law guarantee legal protections for cultural heritage in war, regardless of the belligerents' treaty obligations.

The current regime for protecting cultural property in war has had mixed success. While the International Criminal Tribunal for the former Yugoslavia (ICTY) successfully led several prosecutions for the destruction of cultural property,⁶³ recent terrorist attacks have destroyed similarly irreplaceable works of cultural property. In 2001, the Taliban destroyed the Bamiyan Buddhas, 1,500-year-old statues over 100 feet tall—which were then the largest in the world.⁶⁴ The looting of the National Museum of Iraq in the wake of Operation Iraqi Freedom was another shameful chapter, and stolen artifacts continue to flood illicit antiquities markets fifteen years later.⁶⁵ Pointing to these contemptible episodes, some scholars have criticized the 1954 Hague Convention as ineffective at preventing the loss of these cultural treasures, even as the 1954 Convention's Second Additional Protocol clearly extended its protections to non-state actors.⁶⁶ The Hague Convention, Additional Protocol II, and the 1970 World Heritage Convention have concededly not protected every piece of cultural property, but surely they have saved some.⁶⁷ Yet, because of these treaties, not only does the destruction of cultural property often yield widespread international

61. *Id.* at Rule 39.

62. *Id.* at Rule 40.

63. See O'Keefe, *supra* note 12, at 4–5.

64. Rod Nordland, *2 Giant Buddhas Survived 1,500 Years. Fragments, Graffiti and a Hologram Remain*, N.Y. TIMES (June 18, 2019), <https://www.nytimes.com/2019/06/18/world/asia/afghanistan-bamiyan-buddhas.html> (on file with the *Columbia Human Rights Law Review*).

65. Sigal Samuel, *It's Disturbingly Easy to Buy Iraq's Archeological Treasures*, ATLANTIC MONTHLY (Mar. 19, 2018), <https://www.theatlantic.com/international/archive/2018/03/iraq-war-archeology-invasion/555200/> [<https://perma.cc/3XV4-BXPD>].

66. Eric Posner, *The International Protection of Cultural Property: Some Skeptical Observations*, 8 CHICAGO J. INT'L L. 213, 214 (2007); David Keane, *The Failure to Protect Cultural Property in Wartime*, 14 DEPAUL J. ART, TECH, & INTELL. PROP. L. 1, 16 (2004); Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict art. 11, *opened for signature* May 17, 1999, 2253 U.N.T.S. 172, 216 (entered into force Mar. 9, 2004).

67. O'Keefe, *supra* note 48, at 2 (“[T]he protection of cultural property in armed conflict by means of international law is not a pipe-dream . . . [I]nsofar as the laws of war are capable of changing behavior, the rules to protect cultural property are as capable as any.”).

condemnation,⁶⁸ but international tribunals have also imposed criminal liability for attacks on cultural property.⁶⁹

II. Protecting Cultural Property in Cyberspace

A. Defining Digital and Digitized Cultural Property

1. Digitized Cultural Property

As with almost everything else, advances in computing, digital storage, and connectivity have revolutionized the field of cultural heritage.⁷⁰ Owing to these recent technological advancements, digitized cultural property—whereby tangible or intangible cultural heritage is transformed into information—has exploded in recent years as a method of preserving cultural heritage, offering novel educational opportunities and increasing public access.⁷¹ Digitized cultural property can take several forms, such as scanned texts, audio-visual recordings of music, and 3D renderings. Take, for instance, CyArk, a non-profit established in 2003 after the Taliban's destruction of the Bamiyan Buddhas to “digitally record, archive and share the world’s most significant cultural heritage”⁷² CyArk uses high-tech laser scanning tools to create 3D models of cultural heritage, which it then draws on to create an “immersive virtual reality environment.”⁷³ To date,

68. Press Release, Security Council, Security Council Condemns Destruction, Smuggling of Cultural Heritage by Terrorist Groups, Unanimously Adopting Resolution 2347, U.N. Press Release SC/12764 (Mar. 24, 2017).

69. The most recent success was *Prosecutor v. Ahmad Al Faqi Al Mahdi*, where the ICC sentenced the Malian jihadist to nine years imprisonment for “intentionally directing attacks against 10 buildings of a religious and historical character in Timbuktu, Mali.” *Prosecutor v. Al Mahdi*, ICC-01/12-01/15, Judgement & Sentence, ¶ 1 (Sept. 27, 2016).

70. Yehuda Kalay, *Preserving Cultural Heritage Through Digital Media*, in *NEW HERITAGE: NEW MEDIA AND CULTURAL HERITAGE* 1–11 (Yehuda Kalay et al. eds., 2007) (outlining the conceptual challenges wrought by digital technologies on cultural heritage, as well as practical challenges to collection management and dissemination).

71. EUR. COMM’N, REPORT ON CULTURAL HERITAGE 6 (2019), <https://ec.europa.eu/digital-single-market/en/news/european-commission-report-cultural-heritage-digitisation-online-accessibility-and-digital> [<https://perma.cc/3LLW-R62Y>] (reporting that more than one-third of member states were funding programs to digitize immovable cultural heritage sites); *Digitization at the National Archives*, NAT’L ARCHIVES, <https://www.archives.gov/digitization> [<https://perma.cc/2B8H-KCBB>] (outlining NARA’s strategic plan to digitize 500 million pages of records and make them publicly available by 2024).

72. *Mission Statement*, CYARK, <https://www.cyark.org/ourMission/> [<https://perma.cc/2B8H-KCBB>].

73. *Id.*

CyArk has documented over 200 sites, including Chichéen Itzá in Mexico, the Masjid Wazir Khan in Pakistan, and the Kilwa Kisiwani in Tanzania.⁷⁴ This is a classic example of digitized cultural property, and it is one small part of the broader push in the field of cultural heritage towards digitization in the name of preservation and access.⁷⁵ “Cultural heritage sites all over the world face rapid decline due to aggressive urban expansion, speculative development, wars, and general neglect.”⁷⁶ Random mishaps can befall unprotected cultural property. For example, in November 2016, while attempting to take a selfie, a Brazilian tourist knocked over and destroyed an eighteenth-century statue of Saint Michael at Lisbon’s National Museum of Ancient Art.⁷⁷

This digitization push includes not only tangible but also intangible cultural property.⁷⁸ For example, motion capture technology has allowed the digitization of traditional Japanese dances, allowing master performers to study their craft in a new way while also allowing for the archiving of cultural practices and events.⁷⁹ Additionally, novel digital technologies offer a promising pathway for communities to preserve their cultural heritage, whether it be the oral narratives and song traditions of indigenous

74. *Id.*; *Chichéen Itza*, CYARK, <https://www.cyark.org/projects/chichen-itza/3D-Explorer> [<https://perma.cc/KA2A-MNBM>]; *Masjid Wazir Khan*, CYARK, <https://www.cyark.org/projects/masjid-wazir-khan/overview> [<https://perma.cc/E79K-FMAH>]; *Kilwa Kisiwani*, CYARK, <https://www.cyark.org/projects/kilwa-kisiwani/overview> [<https://perma.cc/5L2R-MMT9>].

75. Neil Silberman, *From Cultural Property to Cultural Data: The Multiple Dimensions of “Ownership” in the Global Digital Age*, 21 INT’L J. CULTURAL PROP. 365, 365 (2014).

76. Kalay, *supra* note 70, at 1 (discussing the difficult questions surrounding the representation, ownership, and dissemination of digital cultural heritage).

77. See Lilit Marcus, *Selfie-Taking Tourist Destroyed 18th-Century Saint Michael Statue in Lisbon*, CONDE NAST TRAVELER (Nov. 10, 2016), <https://www.cntraveler.com/story/selfie-taking-tourist-destroys-18th-century-saint-michael-statue-in-lisbon> [<https://perma.cc/2U9Q-KCJV>]. One might conclude that this was an isolated incident, but five months earlier, a tourist in the same city destroyed a 126-year-old statue of the Portuguese king Dom Sebastiao while also attempting to take a selfie. See Sebastian Modak, *Tourist Wrecks 126-Year-Old Lisbon Statue in Selfie Attempt*, CONDE NAST TRAVELER (May 9, 2016), <https://www.cntraveler.com/stories/2016-05-09/tourist-wrecks-126-year-old-lisbon-statue-in-selfie-attempt> [<https://perma.cc/4TJ8-U6GL>].

78. UNESCO, BASIC TEXTS OF THE 2003 CONVENTION FOR THE SAFEGUARDING OF THE INTANGIBLE CULTURAL HERITAGE 1–19 (2020 ed. 2020), https://ich.unesco.org/doc/src/2003_Convention_Basic_Texts_2018_version-EN.pdf [<https://perma.cc/QHV8-9R3K>].

79. Kozaburo Hachimumura, *Digital Archives of Intangible Cultural Properties*, INT’L CONF. ON CULTURE & COMPUTING, Dec. 17, 2017, at 55, <https://ieeexplore.ieee.org/document/8227341> [<https://perma.cc/N6TG-98U9>].

communities in Canada⁸⁰ or the collective memory and cultural knowledge of Pacific Island communities.⁸¹ These projects are inevitably converted to digital files, placed on storage devices, and often made publicly available through the internet.⁸²

2. Digital Cultural Property as It Exists Today

Digital cultural property, while stored in the same medium as digitized cultural property, is created in a digital format and almost always remains digital.⁸³ The 2003 UNESCO Charter on the Preservation of Digital Heritage defines digital heritage as “cultural, educational, scientific and administrative resources, as well as technical, legal, medical and other kinds of information created digitally, or converted into digital form from existing analog resources.”⁸⁴ The Charter, much like the 1954 Hague Convention, states, “the disappearance of heritage in whatever form constitutes an impoverishment of the heritage of all nations” and that “[digital cultural heritage] should be protected and preserved for current and future generations.”⁸⁵ Also similar to the 1954 Hague Convention, the Charter delegates the decision of what items should and should not be protected to states.⁸⁶ Digital cultural heritage is defined by its ephemerality and its shifting format.⁸⁷ Common examples of digital cultural property include gifs,

80. Kate Hennessy & Murphy Halliburton, *Cultural Heritage on the Web: Applied Digital Visual Anthropology and Local Cultural Property Rights Discourse*, 19 INT’L J. CULTURAL PROP. 345, 347 (2012).

81. Guido Pigliasco, *Intangible Cultural Property, Tangible Databases, Visual Debates: The Sawau Project*, 16 INT’L J. CULTURAL PROP. 255, 255 (2009).

82. See, e.g., Hennessy & Halliburton, *supra* note 80, at 356 (examining the use of digitization to preserve the cultural heritage of the Doig River First Nation).

83. This is not to say that digital cultural property need only exist in a digital format, as digital cultural property can be transformed into real-world mediums. For example, the internet website 9GAG engraved a number of popular internet memes into a 24-ton limestone slab and, for posterity’s sake, buried it somewhere in the world, most likely in southern Spain. The memes included “Philoso-raptor,” “Keyboard Cat,” the “Harlem Shake,” and “Socially Awkward Penguin.” *9GAG Monument*, KNOW YOUR MEME, <https://knowyourmeme.com/memes/events/9gags-meme-monument> [<https://perma.cc/976F-QVLU>]. However, converting digital cultural property to real-world mediums is a rare occurrence due to the expense and humanity’s increasing online presence.

84. UNESCO, *supra* note 3, at art. 1.

85. *Id.*

86. *Id.* at art. 7 (“[T] the main criteria for deciding what digital materials to keep would be their significance and lasting cultural, scientific, evidential or other value. ‘Born digital’ materials should clearly be given priority. Selection decisions and any subsequent reviews need to be . . . based on defined principles, policies, procedures and standards.”).

87. UNESCO, *supra* note 3, at art. 1.

videos, e-books, academic databases, blogs, vlogs, web series, webcomics, sound recordings, video games, and many others as digital cultural property “is inherently unlimited by time, geography, culture or format.”⁸⁸ The emergence of digital cultural property has inspired a bevy of research and activism in the field of digital content and internet preservation.⁸⁹

For a good example of digital cultural heritage, take YouTube, the world’s second most-visited website with two billion unique monthly users.⁹⁰ Every minute, YouTube gains an additional 500 hours of content and hosts content in over eighty languages.⁹¹ Every day, YouTube gains on average four billion daily views.⁹² Google, YouTube’s parent company, is secretive about how its storage system works; one estimate is that in 2013, Google had approximately ten exabytes of data, although it is unclear how much of that is YouTube videos.⁹³ Google stores every video uploaded to the website in one of its twenty-three global Google data centers.⁹⁴ Thus, YouTube hosts a wide range of traditional cultural property, such as

88. UNESCO, *supra* note 3, at art. 9.

89. The following are examples of the types of research and activism produced regarding preservation of digital content. Jerome McDonough & Jianhai Ruan, *Preserving Born-Digital Cultural Heritage in Virtual World*, in 2009 IEEE INTERNATIONAL SYMPOSIUM ON IT IN MEDICINE & EDUCATION 745 (2009) https://www.researchgate.net/publication/261268325_Preserving_Born-digital_Cultural_Heritage_in_Virtual_World (on file with the *Columbia Human Rights Law Review*); *About the Internet Archive*, INTERNET ARCHIVE, <https://archive.org/about/> [<https://perma.cc/RJ7E-DDWW>]; LIBR. OF CONG. NAT’L DIGIT. INFO. INFRASTRUCTURE & PRES. PROT., INTERNATIONAL STUDY ON THE IMPACT OF COPYRIGHT LAW ON DIGITAL PRESERVATION 4–9(2008), https://www.digitalpreservation.gov/documents/digital_preservation_final_report2008.pdf [<https://perma.cc/3AVZ-L6BB>]; Press Release, Libr. of Cong., Update on the Twitter Archive at the Library of Congress (Dec. 26, 2017), <https://blogs.loc.gov/loc/2017/12/update-on-the-twitter-archive-at-the-library-of-congress-2/> [<https://perma.cc/K3JG-4ZJK>]; Richard A. Danner, *Issues in the Preservation of Born-Digital Scholarly Communications in Law*, 96 L. LIBR. J. 591, 591–604 (2004).

90. *The Top 500 Sites on the Web*, ALEXA, <https://www.alexa.com/topsites> [<https://perma.cc/YSE8-GEVZ>]; Press, YOUTUBE, <https://blog.youtube/press> [<https://perma.cc/EF6V-7J59>].

91. YOUTUBE, *supra* note 90.

92. Martin Ombura, *How YouTube Handles Streaming 4,000,000,000+ Daily Videos Without a Hitch*, MEDIUM (Feb. 1, 2019), <https://medium.com/@martinomburajr/how-youtube-handles-streaming-4-000-000-000-daily-videos-without-a-hitch-8542741e957a> [<https://perma.cc/5TFV-PE3B>].

93. Randall Munroe, *Google’s Datacenters on Punch Cards*, XKCD (Sept. 17, 2013), <https://what-if.xkcd.com/63/> [<https://perma.cc/A739-LGMA>]. An exabyte is one billion gigabytes.

94. *Inside a Google Data Center*, YOUTUBE (Dec. 16, 2014), <https://www.youtube.com/watch?v=XZmGGAbHqa0> [<https://perma.cc/F7G3-GD32>]; *Discover Our Data Center Locations*, GOOGLE, <https://www.google.com/about/datacenters/locations/> [<https://perma.cc/G3G5-HG9L>].

traditional Mongolian throat singing,⁹⁵ traditional American Indian dance,⁹⁶ and the Turkish Mevlevi Sema ceremony, in addition to born-digital cultural property.⁹⁷ The website is similarly home to videos of substantial cultural importance to the internet as a whole.⁹⁸ By virtue of its sheer size and popularity, YouTube's kaleidoscopic inventory carries substantial cultural importance. The Internet Archive, an American non-profit known for cataloging the internet through its Wayback Machine, provides a similar example.⁹⁹ As of this writing, the website contains 475 billion webpages, 28 million books and texts, 14 million audio recordings, 3.5 million images, and 6 million videos, totaling over forty-five petabytes of server storage.¹⁰⁰

3. Cyberspace Today

It is worth reflecting on the architecture of cyberspace and how cultural property fits into it. Cyberspace is “[a] global domain within the information environment consisting of interdependent networks of information technology infrastructures and resident data, including the Internet, telecommunications networks, computer systems, and embedded processors and controllers.”¹⁰¹ It is “the sharedness of the virtual environment” which forms the backbone of global telecommunications and media.¹⁰² The information age has produced an extraordinary amount of

95. Batzorig Vaanchig, *Chinggis Khaanii Magtaal Batzorig Vaanchig*, YOUTUBE (Apr. 9, 2014), https://www.youtube.com/watch?v=p_5yt5IX38I [https://perma.cc/BCG3-48BF].

96. Kennedy Center, *Native Pride Dancers–Millennium Stage*, YOUTUBE (Jan. 9, 2018), https://www.youtube.com/watch?v=jpR5H9zu_4k [https://perma.cc/45MT-KLJ4].

97. UNESCO, *The Mevlevi Sema Ceremony*, YOUTUBE (Sept. 28, 2009), https://www.youtube.com/watch?v=_umJcGodNb0 [https://perma.cc/8CNX-7QMK]. This ceremony is also commonly known as the Whirling Dervishes. UNESCO has begun uploading intangible cultural heritage on YouTube and uses the website as a means of storing and disseminating cultural heritage. Sheenagh Pietrobruno, *YouTube and the Social Archiving of Intangible Heritage*, 15 NEW MEDIA & SOC'Y 1, 1 (2013), <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.902.2956&rep=rep1&type=pdf> (on file with the *Columbia Human Rights Law Review*).

98. Rick Astley, *Never Gonna Give You Up (Video)*, YOUTUBE (Oct. 25, 2009), <https://www.youtube.com/watch?v=dQw4w9WgXcQ> [https://perma.cc/VME9-7CEV].

99. *About*, INTERNET ARCHIVE, <https://archive.org/about/> [https://perma.cc/T4BK-VUQS].

100. *Id.* For reference, one petabyte is one million gigabytes of data.

101. Department of Defense, *supra* note 5, at 1012.

102. Chip Morningstar & F. Randall Farmer, *The Lessons of Lucasfilm's Habitat*, 1 J. Virtual Worlds Rsch. 1, 18 (2008), https://web.stanford.edu/class/history34q/readings/Virtual_Worlds/LucasfilmHabitat.html [https://perma.cc/9FSV-CDZ3]; Michael Gervais, *Cyber Attacks and the Laws of War*, 30 BERKELEY J. INT'L L. 525, 525–35 (2011) (giving a brief history of the development of cyberspace); see WILLIAM GIBSON,

data; by some estimates, there were forty-five zettabytes of data globally in 2019,¹⁰³ a number which is expected to grow rapidly.¹⁰⁴ Nestled within this digital haystack lies data of substantial cultural importance. Yet, cyberspace is also a means through which state and non-state actors can accomplish their goals. Cyberwarfare consists of using digital means to accomplish political objectives in an armed conflict and occurs in the same virtual environment that houses culturally significant data.¹⁰⁵ One often-cited example is the Stuxnet computer worm, which the United States and Israel used to damage Iranian uranium centrifuges by altering the centrifuges' rotational frequencies through an exploit in Windows and Siemens software.¹⁰⁶ Because digital and digitized cultural property is often stored on devices connected to cyberspace, it is vulnerable to both cyberattacks and conventional attacks.

Protections for real-world cultural property from cyber-attacks are fairly straightforward. The 1907 Hague Regulations and the 1954 Hague Convention apply regardless of a parties' method of warfare.¹⁰⁷ Thus, it would be just as unlawful to use a cyberattack to cause a gas leak at an enemy's historic museum, thereby causing a fire to damage art, artifacts, and the building itself, as it would be to attack the museum with a cruise missile. The core principles animating the protection of cultural property persist

NEUROMANCER 51 (1982) ("Cyberspace. A consensual hallucination experienced daily by billions of legitimate operators, in every nation, by children being taught mathematical concepts A graphic representation of data abstracted from the banks of every computer in the human system Lines of light ranged in the nonspace of the mind, clusters and constellations of data."); PETER KOLLOCK & MARC A. SMITH, COMMUNITIES IN CYBERSPACE 3 (1999) (describing how cyberspace is defined by text chat, the World Wide Web, and graphical worlds, and how "[i]n cyberspace the economies of interaction, communication, and coordination are different than when people meet face-to-face.").

103. DAVID REINSEL ET AL., INT'L DATA CORP., THE DIGITIZATION OF THE WORLD: FROM EDGE TO CORE 3 (2018), <https://www.seagate.com/files/www-content/our-story/trends/files/idc-seagate-dataage-whitepaper.pdf> [<https://perma.cc/98MC-N2UR>]. A zettabyte is one trillion gigabytes.

104. *Id.* The International Data Corporation estimates that total global storage installations will have a compounded annual growth rate of 17.8% until 2024, equivalent to 8.9 zettabytes of growth in five years. *IDC's Global StorageSphere Forecast Shows Continued Strong Growth in the World's Installed Base of Storage*, IDC (May 13, 2020), <https://www.idc.com/getdoc.jsp?containerId=prUS46303920> [<https://perma.cc/SPG8-NPXF>].

105. TALLINN MANUAL 2.0., *supra* note 4, at 375.

106. Jeremy Richmond, *Evolving Battlefields: Does Stuxnet Demonstrate a Need for Modifications to the Law of Armed Conflict?*, 35 *FORDHAM INT'L L.J.* 842, 849-60 (2012).

107. 1907 Hague Convention, *supra* note 43; 1954 Hague Convention, *supra* note 48.

despite the changes in warfare.¹⁰⁸ However, the application of IHL to digital and digitized cultural property is more complex.

B. Current Protections in LOAC for Cultural Property are Insufficient

As unsettled as IHL is in cyberspace, it is even more unsettled with regards to digital cultural property. Exacerbating this, states are expanding their cyber arsenals as state-launched cyber-attacks become more common.¹⁰⁹ Military units dedicated to computer network operations have risen from five units in 2000 to sixty-three in 2017, a number which is only expected to grow.¹¹⁰ Quantifying the number of cyber operations is almost as difficult as determining their legality in international law. Despite this, the Council on Foreign Relations estimates that state actors perpetrated approximately 480 cyberattacks from 2005 to 2019.¹¹¹ Cyberattacks can have disastrous consequences. Russia's hack of SolarWinds and its government clients in March 2020—a hack so massive that its scope is still unknown¹¹²—is merely the latest demonstration of states' ample cyber arsenals.¹¹³ Other examples are the WannaCry ransomware attack, which

108. Additional Protocol I, *supra* note 57, at art. 1(2); Additional Protocol II, *supra* note 57, at pmbl. (“[I]n cases not covered by the law in force, the human person remains under the protection of the principles of humanity and the dictates of the public conscience . . .”); Darren Stewart, *New Technology and the Law of Armed Conflict*, 87 INT’L L. STUD. 271, 271–73 (2011), <https://digitalcommons.usnwc.edu/cgi/viewcontent.cgi?article=1082&context=ils> [<https://perma.cc/W48H-L7X8>].

109. *Understanding the Proliferation of Cyber Capabilities*, COUNCIL ON FOREIGN AFFS., <https://www.cfr.org/blog/understanding-proliferation-cyber-capabilities> [<https://perma.cc/ZV6Y-93SY>].

110. *Id.*

111. *Cyber Operations Tracker*, COUNCIL ON FOREIGN AFFS., <https://www.cfr.org/cyber-operations/> [<https://perma.cc/NV5V-AEEK>]. This is to say nothing of the considerable prevalence of cybercrime, which might pose a threat to cultural property. Data on cybercrime is lacking, even though it cost the United States economy between \$57 billion and \$109 billion in 2016. Mieke Eoyang & Eileen Decker, *We Need Better Cybercrime Data*, LAWFARE (Apr. 15, 2020), <https://www.lawfareblog.com/we-need-better-cybercrime-data> [<https://perma.cc/FN7U-LJQ3>]; Mieke Eoyang & Michael Garcia, *A Road Map for Tackling Cybercrime*, LAWFARE (Dec. 10, 2020), <https://www.lawfareblog.com/road-map-tackling-cybercrime> [<https://perma.cc/9PJ5-R3WN>].

112. Tom Bossert, *I Was the Homeland Security Adviser to Trump. We’re Being Hacked*, N.Y. TIMES (Dec. 16, 2020), <https://www.nytimes.com/2020/12/16/opinion/fireeye-solarwinds-russia-hack.html> (on file with the *Columbia Human Rights Law Review*).

113. Brian Barrett, *Security News This Week: Russia’s SolarWinds Hack Is a Historic Mess*, WIRED (Dec. 19, 2020), <https://www.wired.com/story/russia-solarwinds-hack-roundup/> [<https://perma.cc/RZ2Q-VVY3>].

indiscriminately spread across the world in 2017, rendering hundreds of thousands of computers useless,¹¹⁴ and the 2017 NotPetya cyberattack on Ukrainian banks, government ministries, newspapers, and utilities.¹¹⁵ Because military and civilian internet infrastructure is so interwoven, an armed conflict poses a substantial danger to digital and digitized cultural property, as belligerents might struggle to distinguish between proper and improper targets in cyberspace.¹¹⁶ Although UNESCO seeks to preserve digital cultural property,¹¹⁷ little thought has been given to digital cultural property's status in an armed conflict.

1. The Extensive Use of Cyberspace for Cultural Property

There are numerous reasons why a state or non-state actor might target cultural property in cyberspace. States or non-state actors might conduct such attacks in “campaigns of ethnic cleansing, identity-bound wars and iconoclastic actions.”¹¹⁸ State and non-state actors might make cultural property part of their war aim, attack cultural property to gain tactical benefits or as a form of costly signaling, or seize cultural property for economic reasons.¹¹⁹ In 2014, North Korea allegedly hacked the U.S. film studio Sony Pictures, destroyed large quantities of data and exposed the personal information of Sony employees and management, showing the vulnerability of cultural data in cyberspace.¹²⁰ The attack was supposedly

114. Thomas P. Bossert, *It's Official: North Korea Is Behind WannaCry*, WALL ST. J. (Dec. 18, 2017, 7:15 PM), <https://www.wsj.com/articles/its-official-north-korea-is-behind-wannacry-1513642537> (on file with the *Columbia Human Rights Review*); Zack Whittaker, *Two Years After WannaCry, a Million Computers Remain at Risk*, TECHCRUNCH (May 12, 2019, 5:37 PM), <https://techcrunch.com/2019/05/12/wannacry-two-years-on/> [<https://perma.cc/H4AG-NFQ6>].

115. Andy Greenberg, *The Untold Story of NotPetya, the Most Devastating Cyberattack in History*, WIRED (Aug. 22, 2018), <https://www.wired.com/story/notpetya-cyberattack-ukraine-russia-code-crashed-the-world/> (on file with the *Columbia Human Rights Law Review*).

116. See Gervais, *supra* note 102, at 567–68 (“In the realm of cyberspace, most Internet infrastructure can serve as a dual-use object because military systems are so often interwoven with civilian infrastructure.”).

117. UNESCO, *supra* note 3; *Cutting Edge: Protecting and Preserving Cultural Diversity in the Digital Era*, UNESCO (Oct. 28, 2020), <https://en.unesco.org/news/cutting-edge-protecting-and-preserving-cultural-diversity-digital-era> [<https://perma.cc/TX4F-EFKH>].

118. Johan Brosché et al., *Heritage Under Attack: Motives for Targeting Cultural Property During Armed Conflict*, 23 INT'L J. HERITAGE STUD. 248, 249 (2017).

119. *Id.*

120. Andrea Peterson, *The Sony Pictures Hack, Explained*, WASH. POST (Dec. 18, 2014), <https://www.washingtonpost.com/news/the-switch/wp/2014/12/18/the-sony->

motivated by Sony Pictures' release of a film deeply critical of North Korea which depicted the death of North Korean leader Kim Jong-un.¹²¹ This is not to say that Seth Rogan and James Franco's 2014 film *The Interview* is of such cultural importance as to warrant protection under international law,¹²² or that the 2014 Sony hack amounted to an armed attack or use of force,¹²³ but

pictures-hack-explained/ (on file with the *Columbia Human Rights Law Review*); see also Tim McCormack, *The Sony and OPM Double Whammy: International Law and Cyber Attacks*, 18 SMU SCI. & TECH. L. REV. 379, 379–81 (2015) (discussing the ramifications of the Sony hack and various characterizations of the act).

121. Peterson, *supra* note 120.

122. As mentioned previously, international law has no objective test for what is or is not protected as cultural property. See O'Keefe, *supra* note 48, at 110–11 (“[W]hile in principle the Convention leaves it to the Party in whose territory the relevant property is situated to determine whether or not that property is of great importance to its cultural heritage and is therefore protected by the Convention,” the practical effect of this is that “the opposing Party must hazard an assessment as to the cultural importance of the property in question to the territorial Party.”); see also 1954 Hague Convention, *supra* note 48 (broadly defining the scope of cultural property protected under the Convention without referencing an objective test). As a result, in cyberspace, belligerents must weigh the importance of targets and determine, reasonably and in compliance with the Vienna Convention on the Law of Treaties, whether the target is legal.

123. What amounts to an “attack” in cyberspace under international law is a fraught question beyond the scope of this paper. Regarding *jus ad bellum*, the key question is whether a cyberattack can amount to a “use of force” prohibited by Article 2(4) of the U.N. Charter. U.N. Charter art. 2, ¶ 4. One common answer is to look at the effects of a cyber operation and determine whether it meets that threshold. See Matthew Waxman, *Cyber Attacks as “Force” Under UN Charter Article 2(4)*, 87 INT’L L. STUD. 43, 45–48 (2011) (stating that a cyber-attack that is sufficiently coercive might amount to a use of force, or that interference in another state’s internal matters might cross that threshold, and that the United States’ position tended towards an effects-based test); see also TALLINN MANUAL 2.0., *supra* note 4, at 330 (“A cyber operation constitutes a use of force when its scale and effects are comparable to non-cyber operations rising to the level of a use of force”); Jeremy Wright, Att’y Gen. of the U.K., *Cyber and International Law in the 21st Century* (May 23, 2018) [check R17.2 on public speeches and addresses] (May 3, 2018), <https://www.gov.uk/government/speeches/cyber-and-international-law-in-the-21st-century> (on file with the *Columbia Human Rights Law Review*) (“If a hostile state interferes with the operation of one of our nuclear reactors, resulting in widespread loss of life, the fact that the act is carried out by way of a cyber operation does not prevent it from being viewed as an unlawful use of force or an armed attack against us.”).

However, the threshold for what constitutes a use of force is fluid and heavily influenced by state practice. Schmitt, *The Law of Cyber Warfare*, *supra* note 10 (“Over time, the reaction of states to cyber operations, as well as how they characterize their own cyber operations, will inform the process of interpretive maturation.”) It is unclear whether data deletion of non-culturally significant data would amount to a use of force. TALLINN MANUAL 2.0., *supra* note 4 (“The development of further State practice notwithstanding, network intrusions, the deletion or destruction of data (even on a large scale), computer network exploitation, and data theft do not amount to a non-international armed conflict.”); Tim McCormack, *International Humanitarian Law and the Targeting of Data*, 94 INT’L L. STUD. 222, 237 (2018); Kubo Mačák, *Military Objectives 2.0: The Case for Interpreting Computer*

the anecdote serves to demonstrate a proof of concept: cyberattacks are a potent means of targeting cultural objects.

Traditional cultural heritage institutions have also become increasingly digitized. In the past twenty years, virtual museums have exploded, with the development of both online-only museums and digitally augmented physical museums.¹²⁴ The Vatican offers 3D virtual tours, as do the Natural History Museum and National Gallery in London, the Dutch Rijksmuseum, the French Musée d'Orsay, and the American Getty Museum.¹²⁵ The American Smithsonian Natural History Museum offers virtual tours online and the New York Metropolitan Museum of Art boasts an impressive online digital collection.¹²⁶ Online-only virtual museums—such as the WebMuseum, the Swedish Internetmuseum, and the National Digital Repository for Museums of India—offer unique access to digital materials and challenge pre-existing notions of cultural heritage institutions.¹²⁷ The advent of immersive virtual and augmented reality provides a new form of access to cultural property, but also creates “a means to produce new forms of art.”¹²⁸ For example, the Petersen Automotive Museum uses virtual reality

Data as Objects Under International Humanitarian Law, 48 ISRAELI L. REV. 55, 56 (2015) (“This article argues in favour of a broad understanding of the notion of ‘object’, bringing data within the scope of the rules on military objectives as codified in Additional Protocol I to the 1949 Geneva Conventions.”).

124. SUZANNE KEENE, *DIGITAL COLLECTIONS 1–8* (1998) (discussing and forecasting how digital technologies will affect cultural heritage institutions).

125. Antonia Wilson, *10 of the World’s Best Virtual Museum and Art Gallery Tours*, THE GUARDIAN (Mar. 23, 2020), <https://www.theguardian.com/travel/2020/mar/23/10-of-the-worlds-best-virtual-museum-and-art-gallery-tours> [https://perma.cc/C3AS-BPWJ].

126. *National Museum of Natural History–Virtual Tours*, SMITHSONIAN, <https://naturalhistory.si.edu/visit/virtual> [https://perma.cc/X7FR-SARB]; *The MET Collection*, METRO.MUSEUM OF ART, <https://www.metmuseum.org/art/collection> [https://perma.cc/J7RH-W5H7].

127. WEBMUSEUM, <https://www.ibiblio.org/wm/> [https://perma.cc/WV5H-PQS4]; INTERNETMUSEUM, <https://www.internetmuseum.se/> [https://perma.cc/49BS-XVCC]; *National Digital Repository for Museums of India*, NAT’L PORTAL OF INDIA, <https://www.india.gov.in/spotlight/national-digital-repository-museums-india> [https://perma.cc/5XT4-HMTN].

128. Marcello Carrozzino & Masimo Bergamasco, *Beyond Virtual Museums: Experiencing Immersive Virtual Reality in Real Museums*, 11 J. CULTURAL HERITAGE 452, 453 (2010). Take the Museum of Pure Form, a project by a consortium of European museums, which uses virtual reality to allow viewers to touch sculptures. “The use of haptic interfaces allows users to perceive suitable tactile stimuli to be able to simulate the hand while in contact with the digital copy of a real statue.” This offers new opportunities to blind or visually impaired users, who for security reasons, are unable to touch sculptures or historic artifacts. *Id.* at 455.

and augmented reality to allow visitors to virtually view historic cars,¹²⁹ the National Museum of Finland uses virtual reality to allow visitors to step inside a painting,¹³⁰ and visitors to the British Museum can digitally handle Bronze Age artifacts through virtual reality technology.¹³¹ Virtual museums further the preservation of and access to cultural property and heritage, challenging notions of authenticity and transforming museums from silos of objects to interactive purveyors of information.¹³² Despite these significant changes in the preservation and presentation of cultural property, IHL has failed to adapt.

Recognizing the threat of cyberattacks, states are already taking steps to back up their critical data. In 2017, Estonia announced that it was creating the world's first "data embassy" in Luxembourg, opening a high-security data center under Estonian control to ensure data continuity in the event of a cyber-attack, natural disaster, or conventional attack on Estonia.¹³³ Additionally, the Assistant Director-General of the National Archives of Australia published a report on the threat that cyber vulnerabilities pose to the nation's archives, galleries, and libraries, and thus Australia's national heritage.¹³⁴ These cultural institutions are so critical that one interesting

129. Rebecca Hills-Duty, *Petersen Automotive Museum Showcases Mixed Reality Exhibit*, VR FOCUS (Jan. 8, 2018), <https://www.vrfocus.com/2018/01/petersen-automotive-museum-showcases-mixed-reality-exhibit/> [https://perma.cc/P74C-PTS9].

130. Rebecca Hills-Duty, *National Museum of Finland Offers Virtual Time Travel*, VR FOCUS (Feb. 16, 2018), <https://www.vrfocus.com/2018/02/national-museum-of-finland-offers-virtual-time-travel/> [https://perma.cc/4GNW-XBC5].

131. *British Museum Offers Virtual Reality Tour of the Bronze Age*, BBC (Aug. 4, 2015), <https://www.bbc.com/news/technology-33772694> [https://perma.cc/268B-PWYH].

132. Werner Schweibenz, *The Virtual Museum: An Overview of Its Origins, Concepts, and Terminology*, 4 MUSEUM REV. 1, 16 (Aug. 2, 2019), http://articles.themuseumreview.org/tmr_vol4no1_schweibenz [https://perma.cc/L9KJ-ZVJX].

133. E-Estonia, *Estonia to Open the World's First Data Embassy in Luxembourg* (June 2017), <https://e-estonia.com/estonia-to-open-the-worlds-first-data-embassy-in-luxembourg/> [https://perma.cc/3CFH-FWN4]. Estonia is also a leader in digitizing cultural heritage, as it plans to make one-third of its cultural heritage digitally available in just five years. Press Release, Ministry of Culture, *A Third of Estonia's Cultural Heritage to be Available Digitally in Five Years* (Mar. 12, 2018), <https://www.kul.ee/en/news/third-estonias-cultural-heritage-be-available-digitally-five-years> [https://perma.cc/3Z4E-6QQU].

134. Anne Lyons, *Identity of a Nation*, AUSTL. STRATEGIC POL'Y INST. (Dec. 5, 2018) <https://www.aspi.org.au/report/identity-nation> (on file with the *Columbia Human Rights Law Review*).

proposal has been to categorize cultural heritage collections as critical infrastructure and afford them enhanced cybersecurity protections.¹³⁵

III. Interpreting International Law to Protect Cultural Property in Cyberspace

A. Digital and Digitized Cultural Property as Archives

A new interpretation of international law is the most effective way to extend international law to cyberspace. Because belligerents are reluctant to acknowledge their actions in cyberspace—indeed, ostensible anonymity and difficulty attributing cyber operations to a state or non-state actor is part of the appeal of cyber operations—it is unlikely that customary international law will bring order to the cyber arena.¹³⁶ The ossification of customary international law requires open state practice driven by a sense of international obligation. This is unlikely to occur in cyberwarfare where states engage in highly classified cyber operations in relative anonymity.¹³⁷ Furthermore, without grievous cyberattacks affecting large numbers of states equally, international political will would likely be insufficient to produce a new treaty to regulate armed conflict in cyberspace, let alone clarify digital cultural property's status in international humanitarian law. As a result, interpretations of existing legal instruments and principles will likely define the evolution of international law in cyberspace.¹³⁸ These interpretations may come through formal statements by states as to their legal position or their armed forces' manuals on the laws of war.¹³⁹ Additionally, "[o]ver time, the reaction of states to cyber operations, as well as how they characterize their own cyber operations, will inform the process of interpretive maturation."¹⁴⁰

135. *Id.*; see also Eliza Chapman, *Should Data Be Considered Critical Infrastructure?*, AUSTL. STRATEGIC POL'Y INST. (2018), <https://www.aspistrategist.org.au/data-considered-critical-infrastructure/> [https://perma.cc/NTU5-85GS] (questioning whether national identity data should be considered critical infrastructure and noting that Estonia has deemed certain data centers located on foreign soil as 'data embassies' to retain sovereign control and security over data).

136. Schmitt, *Taming the Lawless Void*, *supra* note 10.

137. *Id.*

138. *Id.*

139. Department of Defense, *supra* note 5; MINISTÈRE DES ARMÉES, *supra* note 4.

140. Schmitt, *The Law of Cyber Warfare*, *supra* note 10, at 281 (hypothesizing that state interpretation will define the law of targeting, including regarding data destruction as the equivalent of physical destruction).

This Note argues that digital and digitized cultural property are data of cultural importance¹⁴¹ that fall under the 1954 Hague Convention's protections for culturally significant archives and records. An archive, "a repository or collection especially of information,"¹⁴² is a particularly apt description of digital information, which is normally stored either on a device's local hard drive or a server connected to the internet. While a 3D scan of a historic monument is not a historic monument itself, it is a reproduction of an important monument of architecture that is filed away alongside other 3D scans, like books on a shelf. Likewise, archived born-digital cultural property ought to be protected as "moveable or immovable property of great importance to the cultural heritage of every people . . ." ¹⁴³ The fact that digital cultural property exists to preserve cultural heritage, maintain cultural integrity, and provide access to societal memory only strengthens arguments for its protection, since a society implicitly preserves what it values.¹⁴⁴ This is not to say that every scrap of data ought to fall within the ambit of cultural property in IHL. However, data of sufficient cultural, scientific, or religious import, or which when aggregated take on sufficient importance, surely fall within the scope of the 1954 Hague Convention and customary international law. Born-digital cultural property is especially worthy of protection¹⁴⁵ since, unlike digitized cultural property, there is no physical backup if it is altered or destroyed.

141. See Charles Cronin, *3D Printing: Cultural Property as Intellectual Property*, 39 COLUM. J.L. & ARTS 1, 29 (2015) (describing how advances in technology have made possible high quality 3D reproductions of art and antiquities). See generally Silberman, *supra* note 17 (examining the rapid growth of our body of digital and digitized cultural property).

142. *Archive*, MERRIAM-WEBSTER DICTIONARY, <https://www.merriamwebster.com/dictionary/archive> [<https://perma.cc/Y9LV-FSBN>]. The 1954 Hague Convention itself does not define archive, but in the treaty's implementation reports, states repeatedly reference galleries, libraries, cultural centers, and archives as falling within the scope of the treaty. UNESCO, *Report on the Implementation of the 1954 Hague Convention for the Protection of Cultural Property in the Event of an Armed Conflict and Its Two 1954 and 1999 Protocols: Report on the Activities from 1995 to 2004*, U.N. Doc. CLT-2005/WS/6 (2005), <https://uscbs.org/assets/unesco-report-1995-2004.pdf> [<https://perma.cc/B5U8-86QC>]; see also Douglas Cox, *Archives & Records in Armed Conflict: International Law and the Current Debate over Iraqi Records and Archives*, 59 CATH. U. L. REV. 1001, 1015 (2010) (noting that the 1954 Hague Convention and an earlier draft of the Convention both included the word "archives" in their definition of cultural property).

143. 1954 Hague Convention, *supra* note 48, at art. 1(a).

144. See generally John Henry Merryman, *The Public Interest in Cultural Property*, 77 CAL. L. REV. 339, 355-64 (1989) (explaining that cultural property policy is influenced by the objectives of preserving cultural property, promoting authenticity, and making cultural property accessible).

145. UNESCO, *supra* note 3.

IHL's protections for physical records, libraries, and archives are based on their immense value to humankind,¹⁴⁶ much like digital and digitized cultural property. Libraries and archives form the center of a society's collective memory: "[t]he loss of archives is as serious as the loss of memory in a human being."¹⁴⁷ "By their very nature archives are unique both as individual documents and as documents in context. Lost Archives are irreplaceable, any loss is final, reconstruction is impossible."¹⁴⁸ Likewise, though galleries, libraries, archives, and museums ("GLAMs," which are sometimes also referred to as Cultural Heritage Institutions ("CHIs")) do not always hold unique documents, they are irreplaceable centers of cultural heritage and meaning, with this being especially true of national libraries.¹⁴⁹ Archives are "a basic part of the cultural property of States" and are "universally recognized as an essential part of the heritage of every national community."¹⁵⁰ As a result, large collections of documents warrant substantial protection under IHL, subject to limited exceptions for military necessity.¹⁵¹ These protections should extend to digital and digitized cultural

146. See generally Cox, *supra* note 142, at 1004–09 (describing the value of archives and records in the context of armed conflict).

147. UNESCO, *Memory of the World: Lost Memory—Libraries and Archives Destroyed in the Twentieth Century*, at 19, U.N. Doc. CII-96/WS/1 (1996).

148. *Id.* at 20.

149. See *id.* at 1–2 (recognizing that not all libraries hold unique materials, discussing the cultural value of written materials, and detailing various threats to library collections).

150. FRANCESCO FRACIONI & ANA VRDOLJAK, *THE OXFORD HANDBOOK OF INTERNATIONAL CULTURAL HERITAGE LAW* 589 (2020) (quoting Report of the Director-General on the Study Regarding Problems Involved in the Transfer of Documents from Archives in the Territory of Certain Countries to the Country of Their Origin, para. 7, UNESCO Doc. 20 c/102 (1978)).

151. Libraries, archives, and records, unlike other forms of cultural property, such as historic monuments, can be significant to military or intelligence operations. Generally speaking, belligerents have a right to seize documents during hostilities or occupation with some nexus to the conflict or some level of military importance. See 1907 Hague Convention, *supra* note 43, at art. 53 ("An occupying army may generally take "all movable property belonging to the State which may be used for military operations."); *id.* at art. 23(g) (noting that during hostilities, "it is especially forbidden . . . [t]o destroy or seize the enemy's property, unless such destruction or seizure be imperatively demanded by the necessities of war . . ."); 1954 Hague Convention, *supra* note 48, at art. 4 (outlining the duties of belligerents during hostilities and occupation to respect cultural property and refrain from uses which are likely to expose it to destruction, subject to a waiver of imperative military necessity). Because a great number of documents are likely to have little cultural significance and great intelligence or military relevance, military necessity opens the door to a substantial number of documents. Bruce P. Montgomery, *US Seizure, Exploitation, and Restitution of Saddam Hussein's Archive of Atrocity*, 48 J. Am. Stud. 559, 563 (2014) ("The threshold for protecting 'archives' or noncurrent historical, administrative, and legal records as cultural property may therefore be exceedingly low.").

property, which holds immense societal value but happens to be digital rather than analog.

Outside of international law, views of internet websites and digital repositories as archives are not new.¹⁵² One media studies scholar has termed YouTube “the world’s largest archive of moving images.”¹⁵³ Scholars have taken a broad view of an archive, defining it to include “inactive records of continuing value” or “a selection of digital records or digital surrogates of records made available as a curated online collection.”¹⁵⁴ While many websites, such as YouTube and Wikipedia, explicitly state that their mission is not preservation, these online platforms have become de facto democratic digital repositories of substantial cultural importance.¹⁵⁵ As a result, both the content hosted by these websites, as well as the websites themselves, ought to be protected by IHL, just as it already protects the documents contained within a physical archive.

This interpretation is consistent with articles 31 and 32 of the Vienna Convention on the Law of Treaties.¹⁵⁶ According to the Vienna Convention, courts and parties should construe a treaty according to the text’s “ordinary meaning” taken “in the light of its object and purpose.”¹⁵⁷ The

152. See, e.g., Robert Gehl, *YouTube as Archive: Who Will Curate This Digital Wunderkammer?*, 12 INT’L J. CULTURAL STUD. 43, 45 (2009) (“Clearly, YouTube is an archive.”); see also, e.g., Karen F. Gracy, *Moving Image Preservation and Cultural Capital*, 56 LIBR. TRENDS 183, 186–89 (2007) (discussing the impact of online video sharing services on the moving image archive landscape). But see Lindsay Kistler Mattock et al., *A Case for Digital Squirrels: Using and Preserving YouTube for Popular Culture Research*, FIRST MONDAY (2018), <https://firstmonday.org/ojs/index.php/fm/article/view/8163/6625> [<https://perma.cc/5TYE-UKJU>] (rejecting depictions of YouTube as an archive and discussing the challenges associated with archiving YouTube content).

153. Pelle Snickars, *The Archival Cloud*, in THE YOUTUBE READER 292 (Pelle Snickars & Patrick Vonderau eds., 2009).

154. DICTIONARY OF ARCHIVES TERMINOLOGY, *Archives*, <https://dictionary.archivists.org/entry/archives.html> [<https://perma.cc/PA4U-GQG8>] (“The most central term to the field of archives is also the most fraught.”).

155. Gracy, *supra* note 152; see also Kate Theimer, *Archives in Context and as Context*, 1 J. DIGIT. HUMAN. 65, 65–69 (2012) (describing different definitions of archives in digital humanities and archival studies and noting the expansion of the term).

156. Vienna Convention on the Law of Treaties arts. 31–32, *opened for signature* May 23, 1969, 1155 U.N.T.S. 331 (entered into force Jan. 26, 1980) (“A treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given.”).

157. *Id.* at art. 31; see also Interpretation of the Convention of 1919 Concerning Employment of Women During the Night, Advisory Opinion, 1932 P.C.I.J. 383 (Nov. 15) (“I do not see how it is possible to say that an article of a convention is clear until the subject and aim of the convention have been ascertained, for the article only assumes its true import in this convention and in relations thereto.”); Georg Nolte, *Treaties over Time in Particular: Subsequent Agreement and Practice*, Int’l Law Comm’n, at 365, UN Doc. A/63/10 (2008), <http://untreaty.un.org/ilc/reports/2008/english/annexA.pdf> (on file

plain text of the 1954 Hague Convention protects reproductions of cultural property, as well as manuscripts, books, archives, and buildings holding cultural property.¹⁵⁸ The purpose of the Hague Convention also supports this interpretation. The Hague Convention was created because “developments in the technique of warfare” posed new threats to cultural heritage,¹⁵⁹ similar to how the prevalence and integration of digital technologies poses new threats to cultural heritage.¹⁶⁰ Because “the preservation of the cultural heritage is of great importance for all peoples of the world,” the Hague Convention strengthened and clarified international legal protections for cultural property;¹⁶¹ it would be deeply ironic if an instrument designed to protect cultural heritage failed to protect the predominant medium of human culture.¹⁶²

Subsequent practice by parties to the Hague Convention also supports protection for digital and digitized cultural property.¹⁶³ Several states have included digitized cultural data in their implementation reports filed consistent with the 1954 Hague Convention.¹⁶⁴ Belgium included its digitization of museum institutions,¹⁶⁵ Cyprus mentioned its use of GIS technologies to create an inventory of ancient monuments,¹⁶⁶ Greece

with the *Columbia Human Rights Law Review*) (“[Treaties] are instruments for providing stability to their parties and to fulfil the purposes which they embody. They can therefore change over time, must adapt to new situations, evolve according to the social needs of the international community”); Sergio Marchisio, Remarks at the 10th United Nations Workshop on Space Law, (Sept. 5–8, 2016).

158. 1954 Hague Convention, *supra* note 48, at art. 1(a).

159. *Id.* at pmb1.

160. *Cutting Edge: Protecting and Preserving Cultural Diversity in the Digital Era*, UNESCO (Oct. 28, 2020), <https://en.unesco.org/news/cutting-edge-protecting-and-preserving-cultural-diversity-digital-era> [<https://perma.cc/R632-ZG3E>].

161. 1954 Hague Convention, *supra* note 48, at pmb1.

162. The International Telecommunications Union estimates that 53.6% of humanity uses the internet, with that number rising to 86.6% in the developed world and 69% of people ages 15–24 globally. INT’L TELECOMMS. UNION, *Measuring Digital Development: Facts and Figures 2020*, <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2020.pdf> [<https://perma.cc/9573-BBMF>].

163. Vienna Convention, *supra* note 156, art. 31(3)(b) (“There shall be taken into account, together with the context: . . . any subsequent practice in the application of the treaty which establishes the agreement of the parties regarding its interpretation.”).

164. UNSECO, REPORT ON THE IMPLEMENTATION OF THE 1954 HAGUE CONVENTION FOR THE PROTECTION OF CULTURAL PROPERTY IN THE EVENT OF AN ARMED CONFLICT AND ITS TWO (1954 AND 1999) PROTOCOLS: 2005-2010 (2011), http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/periodic_report_2011_en.pdf [<https://perma.cc/GDN7-FCHX>].

165. *Id.* at 27.

166. *Id.* at 30.

referenced its “digitalization of the archive of monuments,”¹⁶⁷ and Australia noted its efforts at digitizing archives,¹⁶⁸ as did Turkey¹⁶⁹ and Estonia.¹⁷⁰ Azerbaijan considered its digitization of aged sound records to be a fulfillment of its peacetime treaty obligations under the 1954 Hague Convention,¹⁷¹ and Germany did the same with over two million archival documents from the Wossidlo ethnographic archive.¹⁷² Following suit, the Holy See has digitized over 400,000 pages of reproductions from its archives, “providing the minimum necessary redundancy to guarantee the conservation of high-quality copies in the event the originals are lost.”¹⁷³ Such efforts demonstrate that parties to the 1954 Hague Convention consider digital archives and records to be an essential means of cultural heritage preservation and lend credence to the treaty’s protection of digital and digitized cultural property.

B. Belligerents’ Obligations Towards Digital and Digitized Cultural Property

Although digital cultural property should fall within the scope of the law of armed conflict, novel characteristics of the cyber domain alter what obligations belligerents have towards cultural property. In the current international legal regime, states have the following core obligations to cultural property: 1) states are prohibited from targeting cultural property or directing “acts of hostility [towards it]”;¹⁷⁴ 2) states are prohibited from using cultural property in a way that would imperil it; 3) states are prohibited from plundering or looting cultural property or from making reprisals against it; and 4) states are obliged to stop the theft, pillage, misappropriation, and vandalism of cultural property.¹⁷⁵ These obligations, rooted in the 1954 Hague Convention and customary international law, are core protections for cultural property and heritage.¹⁷⁶

167. *Id.* at 93.

168. *Id.* at 25.

169. *Id.* at 46–47.

170. *See id.* at 4 (noting Estonia’s accession to both protocols).

171. *Id.* at 26.

172. *Id.* at 33.

173. *Id.* at 35.

174. Additional Protocol I, *supra* note 57, at art. 53.

175. 1954 Hague Convention, *supra* note 48, at art. 4.; Additional Protocol I, *supra* note 57.

176. *See O’KEEFE, supra* note 48, at 316–43 (2006) (outlining belligerents’ prohibitions and obligations in LOAC and the legal sources of these prohibitions and obligations).

These obligations are clear when an army is advancing across a territory dotted with ancient ruins but are murkier in cyberspace where the content and location of cultural data is inherently changing. For example, Wikipedia has over six million articles in English,¹⁷⁷ articles in over 314 languages,¹⁷⁸ and, with two billion unique visitors per month,¹⁷⁹ is the thirteenth most-visited website in the world.¹⁸⁰ Wikipedia's fifty-two million pages, along with its complete edit history, amounted to ten uncompressed terabytes in 2015, and Wikimedia Commons, which hosts all the media files on Wikipedia, totaled over twenty-three terabytes as of 2014.¹⁸¹ As the largest encyclopedia ever created,¹⁸² Wikipedia surely falls into the category of an archive under the 1954 Hague Convention and the 1907 Hague Regulations, as it is dedicated to "science, or charitable purposes."¹⁸³ However, by its very nature, Wikipedia is constantly changing and growing, making destruction or vandalism by a state difficult to define. Wikipedia, like many online spaces, is a collaborative exchange between users. Acts of vandalism and the occasional deletion of articles by Wikipedia editors are not uncommon on the site. For example, vandals once changed the article on run-on sentences to be one long run-on sentence. They also posted the personal information of prominent Republican politicians during U.S. Supreme Court Justice Brett Kavanaugh's confirmation hearings.¹⁸⁴ More

177. *Size of Wikipedia*, WIKIPEDIA (Dec. 10, 2020), https://en.wikipedia.org/wiki/Wikipedia:Size_of_Wikipedia [<https://perma.cc/3NNP-VE6K>].

178. *List of Wikipedias*, WIKIPEDIA (Dec. 10, 2020), https://en.wikipedia.org/wiki/List_of_Wikipedias [<https://perma.cc/3MDA-CA5K>].

179. *Wikipedia*, WIKIPEDIA (Dec. 10, 2020), <https://en.wikipedia.org/wiki/Wikipedia> [<https://perma.cc/N33H-A6XG>].

180. *Top Sites*, ALEXA (Dec. 10, 2020), <https://www.alexa.com/topsites> [<https://perma.cc/Y84R-WDJ4>].

181. *Size of Wikipedia*, WIKIPEDIA (Dec. 10, 2020), https://en.wikipedia.org/wiki/Wikipedia:Size_of_Wikipedia [<https://perma.cc/3NNP-VE6K>]. One terabyte is 1000 gigabytes.

182. *Wikipedia: Size Comparisons*, WIKIPEDIA (Nov. 9, 2021), https://en.wikipedia.org/wiki/Wikipedia:Size_comparisons#Wikipedia [<https://perma.cc/A9FL-CXFB>]. Prior to Wikipedia, the largest encyclopedia ever was the *Yongle dadian*, a Chinese encyclopedia compiled by 2,169 scholars and completed in 1408. When Anglo-French forces looted Beijing during the Second Opium War, they destroyed much of the Yongle Encyclopedia; as a result, only 800 of its original 22,877 chapters remain, highlighting the danger armed conflict poses to cultural property. Charles Hartman, *Chinese Historiography in the Age of Maturity, 960–1368*, in 2 OXFORD HISTORY OF HISTORICAL WRITING 37, 42 (Daniel Woolf et al., eds. 2012).

183. HENCKAERTS & DOSWALD-BECK, *supra* note 18.

184. *Vandalism on Wikipedia*, WIKIPEDIA (Dec. 10, 2020), https://en.wikipedia.org/wiki/Vandalism_on_Wikipedia [<https://perma.cc/KW3M-HF5A>]. Perhaps more humorously, in 2006 American comedian Stephen Colbert attempted to assist the endangered African elephant by encouraging his viewers to change the African elephant's Wikipedia page to show elephant populations were skyrocketing. Similarly, in 2007,

sinisterly, the BBC reported in 2019 on how the People's Republic of China was encouraging its citizens to edit Wikipedia entries on several sensitive topics, to "reflect our voices and opinions in the entry, so as to objectively and truly reflect the influence of Chinese path and Chinese thoughts on other countries and history."¹⁸⁵ Approximately 1,600 edits were made to Wikipedia pages for Hong Kong, Taiwan, the 1989 Tiananmen Square protests, and nineteen other politically sensitive articles, although no coordinated cyber operation was uncovered.¹⁸⁶

One way to determine when state activity in cyberspace impermissibly disrupts cultural property is a sliding scale analysis: how much of an effect does the military operation have on the digital cultural property? A group of soldiers stealing, defacing, or destroying one book or document from an archive likely has a *de minimis* effect on the entirety of the archive. Similarly, a proper analysis might be to what degree a cyber operation affects the entirety of a cultural data set. North Korea might decide to selectively edit the Wikipedia page of Kim Jong-un as part of an information operation, but that would be far less damaging than a broad cyber operation defacing or deleting large quantities of Wikipedia, or any other interactive cultural data set. It would be important to consider the ease of repair as well. For instance, digitized cultural data might be the sole remnant of lost cultural property, and thus critical for reconstruction, similar to how eighteenth century art was essential to reconstructing Warsaw's Old Town after World War II.¹⁸⁷ In the twenty-first century, cultural heritage experts are repairing the damage done by ISIS by using crowdsourced images of Mosul and historic sites in the Levant to 3D print lost artifacts and reproduce destroyed urban environments in virtual reality.¹⁸⁸ Respect for these 3D prints and images during warfare is critical, as they are the last remnants of now-destroyed cultural property.

States' other obligations towards cultural property translate well into cyberspace. In peacetime, states must protect digital and digitized

Microsoft allegedly offered to pay software engineers to edit certain Wikipedia pages so that they might be more favorable to Microsoft. *Conflict of Interest Editing on Wikipedia*, WIKIPEDIA (Nov. 9, 2021), https://en.wikipedia.org/wiki/Conflict-of-interest_editing_on_Wikipedia#Microsoft [<https://perma.cc/MND8-PKXX>].

185. Carl Miller, *China and Taiwan Clash over Wikipedia Edits*, BBC (Oct. 4, 2019), <https://www.bbc.com/news/technology-49921173> [<https://perma.cc/8G2H-5ZSE>].

186. *Id.*

187. Daryl Mersom, *Story of Cities #28: How Postwar Warsaw Was Rebuilt Using 18th Century Paintings*, GUARDIAN (Apr. 22, 2016, 2:30 AM), <https://www.theguardian.com/cities/2016/apr/22/story-cities-warsaw-rebuilt-18th-century-paintings> [<https://perma.cc/ZDH2-WFNS>].

188. *Rekrei: A Summary*, REKREI (Nov. 9, 2021), <https://projectmosul.org/about> [<https://perma.cc/YG5A-EJJ5>].

cultural property from theft, pillage, misappropriation, or vandalism, either by state or non-state actors.¹⁸⁹ Additionally, states must conduct operations in cyberspace in such a manner as to avoid imperiling digital or digitized cultural property.¹⁹⁰ However, under existing international law, a state would not be obligated to provide access to cultural property during an armed conflict. For instance, a distributed denial of service (“DDOS”) attack, one of the most common forms of cyberattacks which takes down a network by flooding it with requests, on digital or digitized cultural property, would not necessarily violate international law.¹⁹¹

However, a DDOS attack might be considered an “act of hostility” within the meaning of the Additional Protocols to the Geneva Convention IV.¹⁹² Additional Protocol II does not protect archives or libraries, but instead protects “historic monuments, works of art, or places of worship which constitute the cultural or spiritual heritage of peoples.”¹⁹³ At the same time, the ICRC interprets the Additional Protocols to incorporate the 1954 Hague Convention’s definition of cultural heritage and property, which would extend protections for cultural property despite the Additional Protocols’ text not mentioning archives.¹⁹⁴ According to the ICRC, an “act of hostility” need not have a substantive effect on the cultural property itself, so long as it is “directed against” the cultural property.¹⁹⁵ Indeed, if a DDOS attack qualifies as an “act of hostility,” then Additional Protocols I and II and the 1954 Hague Convention would prohibit it.¹⁹⁶ Thus, it is conceivable that IHL would prohibit a DDOS attack on digital cultural property.¹⁹⁷

189. 1954 Hague Convention, *supra* note 48, at arts. 3, 7.

190. *Id.*

191. An “act of hostility” includes acts which are non-violent and may not cause any damage. It need not be an attack, but must take place within the context of hostilities. Int’l Comm. Red Cross, *supra* note 59, at ¶ 2070; *see also* Hathaway et al., *supra* note 9, at 837 (defining DDOS attacks and providing examples).

192. Additional Protocol II, *supra* note 57, at art. 16.

193. *Id.*

194. Int’l Comm. Red Cross, *supra* note 59.

195. *Id.* at ¶ 2070.

196. 1954 Hague Convention, *supra* note 48, at art. 4(1) (“[P]arties undertake to respect cultural property . . . by refraining from any use of the property . . . for purposes which are likely to expose it to destruction or damage in the event of armed conflict; and by refraining from any act of hostility, directed against such property.”).

197. *See* Additional Protocol I, *supra* note 57, at art. 53. For example, if a belligerent decided to launch a DDOS attack on the Internet Archive—an American non-profit digital library with the mission of providing “Universal Access to All Knowledge,” then under the ICRC’s interpretation of Additional Protocols I and II—that attack may amount to an act of hostility and thus a violation of international law. *See About the Internet Archive*, *supra* note 89.

Another major issue in international legal obligations comes from how data challenges the territoriality of the 1954 Hague Convention.¹⁹⁸ While territorial location does not affect customary international legal obligation to refrain from damaging cultural property during armed conflict,¹⁹⁹ the Convention requires parties to “undertake to prepare in time of peace for the safeguarding of cultural property *situated within their own territory* against the foreseeable effects of an armed conflict”²⁰⁰ Articles 12 and 13 of the Convention outline specific provisions for the safety of cultural property during transport.²⁰¹ However, data, unlike physical cultural property, rapidly crosses international boundaries along pre-determined paths and is often highly divisible.²⁰² A reasonable interpretation of states’ peacetime obligation might include replicating cultural data that resides in their territory for a substantial time or replicating cultural property of particular importance to the state’s own culture.

This shift in established notions of territoriality has additional implications. Traditionally, states would claim ownership over real-world cultural property within their borders. For example, the Taj Mahal is a UNESCO World Heritage Site²⁰³ that has special cultural importance to India, where it is located. Most nations seek to control their cultural property in the interest of its “retention, preservation, study, enjoyment, and exploitation.”²⁰⁴ This may be the case for digital cultural property as well,²⁰⁵ but others might be content with storing digital cultural property on a server in another country. International law’s focus on cultural internationalism simplifies this issue.²⁰⁶ Insofar as cultural property is the “cultural heritage of all mankind,”²⁰⁷ a state must protect digital cultural property within its territory regardless of its cultural origin. Museums across the world already do this; for example, the MET Digital Collection features scans of masks from

198. For a more thorough analysis of how data challenges traditional territorial notions of jurisdiction, see Jennifer Daskal, *The Un-Territoriality of Data*, 125 YALE L.J. 326, 365–78 (2015).

199. HENCKAERTS & DOSWALD-BECK, *supra* note 18, at Rule 38–41.

200. 1954 Hague Convention, *supra* note 48, at art. 3 (emphasis added).

201. *Id.* at arts. 12–13.

202. Daskal, *supra* note 198, at 366.

203. *Taj Mahal*, UNESCO (Nov. 7, 2021), <http://whc.unesco.org/en/list/252> [<https://perma.cc/BBZ8-NY8P>].

204. John Merryman, *Thinking About the Elgin Marbles*, 83 MICH. L. REV. 1881, 1888 (1985) [hereinafter Merryman, *Elgin Marbles*].

205. See Press Release, e-Estonia, *supra* note 133 (reporting on Estonia’s creation of a “digital embassy”).

206. See Merryman, *supra* note 48 (thinking about cultural property as an international concern, which the author calls “cultural internationalism”).

207. 1954 Hague Convention, *supra* note 48, at pmbl.

Benin,²⁰⁸ Monet's Haystacks,²⁰⁹ and Tibetan musical instruments.²¹⁰ The location of any culturally significant data should not be a determinative factor in states' obligations towards it, especially given the incredibly fluid nature of data.

C. Protections for Replicas of Cultural Property in Cyberspace: Addressing Counter-Arguments

A common question scholars pose is how digital technologies affect the authenticity of art.²¹¹ German philosopher Walter Benjamin argued that each work of art possesses a unique "aura" which mechanical reproduction erases, and thus, reproduction destroys the work's authenticity.²¹² This is undeniably a motivation for protecting real-world cultural property and it is why reproductions often fail to stand in for stolen cultural property.²¹³ Humanity yearns for cultural objects because they are true and certain and possess some kind of uniqueness.²¹⁴ In addition to serving as surrogates,

208. *Queen Mother Pendant Mask: Iyoba*, METRO. MUSEUM OF ART (Nov. 7, 2021), <https://www.metmuseum.org/art/collection/search/318622?searchField=All&sortBy=Relevance&ft=Masks&offset=0&rpp=20&pos=2> [<https://perma.cc/JMP2-PQTS>].

209. *Haystacks (Effect of Snow and Sun)*, METRO. MUSEUM OF ART (Nov. 7, 2021), <https://www.metmuseum.org/art/collection/search/437122?searchField=All&sortBy=Relevance&ft=Monet&offset=0&rpp=20&pos=9> [<https://perma.cc/4CYK-YQTY>].

210. *Damaru*, METRO. MUSEUM OF ART (Nov. 7, 2021), <https://www.metmuseum.org/art/collection/search/500782?searchField=All&sortBy=Relevance&ft=Musical+Instruments&offset=40&rpp=20&pos=50> [<https://perma.cc/JCF7-RWHX>].

211. See Jeff Malpas, *Cultural Heritage in the Age of New Media*, in NEW HERITAGE: NEW MEDIA AND CULTURAL HERITAGE 13 (Yehuda Kalay et al. eds., 2007) (arguing that without a physical location, the work loses a proper sense of heritage); Fiona Cameron, *Beyond the Cult of the Replicant: Museums and Historical Digital Objects—Traditional Concerns, New Discourses*, in THEORIZING DIGITAL CULTURAL HERITAGE: A CRITICAL DISCOURSE 49 (Fiona Cameron & Sarah Kenderdine eds., 2007) (examining the discourse around original works versus digital copies).

212. Walter Benjamin, *The Work of Art in the Age of Mechanical Reproduction*, in A MUSEUM STUDIES APPROACH TO HERITAGE 226 (Sheila Watson et al. eds., 2018) ("One might generalize by saying: the technique of reproduction detaches the reproduced object from the domain of tradition.").

213. Merryman, *Elgin Marbles*, *supra* note 204, at 1913 (discussing the legal issues surrounding the potential repatriation of the Elgin Marbles to Greece and noting that "the Marbles are, or could easily be made to be, as accessible to the Greeks through reproductions as through the originals. There must be some cultural magic inherent in the authentic object . . .").

214. See *id.* at 1923 ("We need [cultural artifacts] to tell us who we are and where we came from . . . [and] to demonstrate our common humanity.").

digital objects are material in their own right, existing in space and time independently of that which they replicate.²¹⁵ For example, where once a photograph was seen as a simulacrum, “it has now attained a status of its own as a creative work as well as value as a historical document, along with its archival and interpretive roles. Photographs, according to Roland Barthes, radiate an aura, a distance, reference to a past and memory.”²¹⁶ However, authenticity is not the only reason why cultural property is considered worth preserving. Cultural property contains a society’s memories, brings substantial economic benefits through the antiquities trade or tourism, fosters a sense of community and identity, and by extension, has political value.²¹⁷ This is to say nothing of the value digitized reproductions have as a means of preservation and access, or how societies are capable of creating complex emotional relationships with replicas.²¹⁸

The strongest argument against interpreting LOAC to protect digital and digitized cultural property is that data is easily reproducible and disseminated, making its destruction exceedingly difficult and legal protections unnecessary. The Tallinn Manual 2.0, an influential academic publication outlining international law in cyberspace, incorporates this point; it argues that belligerents “must respect and protect cultural property that may be affected by cyber operations or that is located in cyberspace.”²¹⁹ However, the Manual continues, “[p]rotection only applies to digital copies or versions where the original is either inaccessible or has been destroyed,

215. Cameron, *supra* note 211, at 67.

216. *Id.* at 70.

217. Merryman, *Elgin Marbles*, *supra* note 204. See generally Deidre Brown, *Te Ahua Hiko: Digital Cultural Heritage and Indigenous Objects, People, and Environments*, in *THEORIZING DIGITAL CULTURAL HERITAGE: A CRITICAL DISCOURSE* 78 (Fiona Cameron & Sarah Kenderdine eds., 2007) (describing how digital technologies allow indigenous peoples to recover and record their cultural heritage, focusing on the Maori people.).

218. Sally Foster & Sian Jones, *The Untold Heritage Value and Significance of Replicas*, 21 CONSERVATION & MGMT. ARCHAEOLOGICAL SITES 19 (2019) (in discussing the historic replicate of St. John’s Cross on Iona in Scotland, demonstrating how a “replica can acquire authenticity and aura, how its life impacts positively on the life of the original and other copies, and how a replica can generate and extend networks, mediating experiences of authenticity in the process.”); see generally BIANCA BOSKER, *ORIGINAL COPIES: ARCHITECTURAL MIMICRY IN CONTEMPORARY CHINA* (2013) (discussing the Chinese trend of building themed communities modeled on Western cities and towns).

219. TALLINN MANUAL 2.0, *supra* note 4, at 534. This is a rather odd position for the Tallinn Manual to take, since it states that data is not an object and is therefore not protected by the principle of distinction. Yet digital cultural property is an exception, demonstrating that the Manual fails to appropriately value data and digital assets. See Rain Liivoja & Tim McCormack, *Law in the Virtual Battlespace: The Tallinn Manual and the Jus in Bello*, 15 Y.B. INT’L HUMANITARIAN L. 45, 53 (2012) (noting the inconsistency in the Manual’s approach that the destruction of data itself is not considered an attack, while the destruction of digital cultural property is governable under the Law of Armed Conflict).

and where the number of digital copies that can be made is limited."²²⁰ It then gives the example of a one terabyte high-resolution image of the *Mona Lisa*, which would be granted protection if the original were destroyed.²²¹

The "replication" argument fails for several reasons. First, the fact that cultural property *may* be lodged on a hard drive somewhere else in the world does not mean that it is or will be. Even accepting the replication argument as valid fails to recognize the peacetime duty to preserve and protect cultural property, which is recognized under the Hague Convention.²²² Digital cultural property is easily duplicated and stored, but this does not eliminate the need for a legal duty to duplicate and store digital cultural property. There are numerous examples of digital cultural works being lost or nearly lost because of a failure to maintain proper backups.²²³ Even the existence of a backup is no guarantee if the data storage is centralized, as a conventional attack on a data center could destroy all existing copies of a culturally significant file.²²⁴ Such a conventional attack is not unlikely, as military and civilian internet infrastructure are largely

220. TALLINN MANUAL 2.0, *supra* note 4, at 535–36.

221. *Id.* This example is largely divorced from reality. An extremely high-resolution image of the *Mona Lisa* is available online already, consisting of 83,360,934 pixels. It amounts to only 89.94 megabytes. *Mona Lisa*, WIKIPEDIA (Nov. 9, 2021), https://en.wikipedia.org/wiki/File:Mona_Lisa_by_Leonardo_da_Vinci_from_C2RMF_retouched.jpg [<https://perma.cc/3NDS-8TQP>]. By focusing on single cultural artifacts, the Tallinn Manual misses the extraordinary growth in the amount of digital and digitized cultural property and the aggregate value of cultural data.

222. 1954 Hague Convention, *supra* note 48, at art. 3.

223. For example, Pixar nearly deleted *Toy Story 2* during production because of user error. Large portions of the film were only saved because a technical director had a copy on her home computer, which she wrapped in blankets and carefully drove to Pixar headquarters. Gillian Orr, *Pixar's Billion-Dollar Delete Button Nearly Lost Toy Story 2 Animation*, INDEPENDENT (May 17, 2012), <https://www.independent.co.uk/arts-entertainment/films/news/pixar-s-billion-dollar-delete-button-nearly-lost-toy-story-2-animation-7758083.html>. Another interesting example is that NASA erased the original tapes of the first moon landing. This resulted in NASA having to digitally restore copies it obtained from CBS News. Maggie Fox, *Moon Landing Tapes Got Erased, NASA Admits*, REUTERS (July 16, 2009), <https://www.reuters.com/article/us-nasa-tapes/moon-landing-tapes-got-erased-nasa-admits-idUSTRE56F5MK20090716> [<https://perma.cc/N7W7-2HE7>].

224. For example, Google boasts of the extensive and redundant physical security measures at its cloud data centers, including vehicle barriers, biometric identification sensors, cameras, metal detectors, and armed guards. *Google Infrastructure Security Design Overview*, GOOGLE (Jan. 2017), <https://cloud.google.com/security/infrastructure/design/#introduction> [<https://perma.cc/KP8G-UMP5>]. This level of physical security is typical of large data centers, and while it is sufficient to prevent intruders, it is not designed to withstand a coordinated military offensive.

interconnected.²²⁵ For example, Microsoft has contracted to store 80% of Department of Defense data and applications, making it difficult to distinguish between military and civilian targets.²²⁶ In addition to their peacetime duty to duplicate digital cultural property, belligerents during an armed conflict have to engage in a foreseeability analysis before conducting certain cyber operations to determine whether the digital cultural property they might jeopardize has in fact been duplicated, or even if it is endangered. Belligerents already use this test to determine the lawfulness of a target in the absence of notice of its cultural importance.²²⁷

Second, the texts of the Hague Convention and the Additional Protocols to the Geneva Conventions refute this argument. The Hague Convention explicitly protects “important collections of books or archives or of reproductions,” so copies of digital cultural property would likely warrant protection.²²⁸ During the Convention’s negotiations, the delegates from Switzerland and France insisted on the inclusion of protections for reproductions, “so that future generations would at least have the opportunity of seeing photographs of such works if the originals had been destroyed.”²²⁹ Additional Protocols I and II to the Geneva Convention outlaw “any acts of hostility directed against” cultural property.²³⁰ Applying this language, ICTY in *Prosecutor v. Jokic*, which concerned Yugoslav attacks on the Old Town of Dubrovnik, a UNESCO World Heritage site, concluded that Additional Protocols I and II prohibit attacks on cultural property “whether or not the attacks result in actual damage.”²³¹ Following this reasoning, LOAC

225. Gervais, *supra* note 102, at 565–71 (discussing the difficulties of distinguishing between civilian and military targets in cyberspace).

226. DEP’T OF DEFENSE, DODIG-2020-079, REPORT ON THE JOINT ENTERPRISE DEFENSE INFRASTRUCTURE (JEDI) CLOUD PROCUREMENT 42 (Apr. 13, 2020) [<https://perma.cc/2WSE-PVBN>]; Press Release, Department of Defense, DOD Reaffirms Original JEDI Cloud Award to Microsoft (Sept. 4, 2020), <https://www.defense.gov/Newsroom/Releases/Release/Article/2337557/dod-reaffirms-original-jedi-cloud-award-to-microsoft/> [<https://perma.cc/JZK9-BP2S>].

227. O’KEEFE, *supra* note 48, at 111.

228. 1954 Hague Convention, *supra* note 48, art. 1(a).

229. TOMAN, *supra* note 29, at 53.

230. Additional Protocol II, *supra* note 57, at art. 16; Additional Protocol I, *supra* note 57, at art. 53.

231. Prosecutor v. Jokic, Case No. IT-01-42-T, Sentencing Judgement, ¶ 50 (ICTY March 18, 2004), https://www.icty.org/x/cases/miodrag_jokic/tjug/en/jok-sj040318_e.pdf [<https://perma.cc/5QTX-VS2A>]. This is consistent with the ICRC’s interpretation of the Additional Protocols, which defines an act of hostility as “as any act arising from the conflict which has or can have a substantial detrimental effect on the protected objects.” INT’L COMM. RED CROSS, COMMENTARY TO ADDITIONAL PROTOCOL I TO THE GENEVA CONVENTION ¶ 2070 (1987), <https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Comment.xsp?action=openDocument&documentId=501D619BA5E17158C12563CD00434AF5>

would prohibit a cyber or conventional attack on culturally important data, even if that data is backed up elsewhere, with the destruction of the only extant copy of culturally important data possibly being a grave breach of international law.²³²

Third, and most importantly, domestic copyright laws can impede the dissemination of cultural data, making it far more complicated than simply copying files.²³³ Copyright generally prohibits the reproduction of copyrighted work, whether for profit or not.²³⁴ For example, in the United States, archives and libraries are limited in their ability to reproduce copyrighted materials, and the number of copies they can make depends on the time remaining on the copyright, whether the material is unpublished, and whether the work is subject to “commercial exploitation.”²³⁵ This is further complicated by substantial differences in national intellectual property (“IP”) legal regimes, which may or may not inhibit the reproduction and preservation of cultural heritage, and to what extent copyright can cover cultural data.²³⁶ However, “[t]he traditional point of view of museums, no

[<https://perma.cc/G48W-79AW>]. “For a violation of the article to take place it is therefore not necessary for there to be any damage.” *Id.*

232. Additional Protocol I, *supra* note 57, at art. 85(4)(d) (establishing that it is a grave breach of the Geneva Conventions to willfully violate the Conventions or Additional Protocols by attacking cultural property that is awarded “special protection”); see *Prosecutor v. Kordić*, Case No. IT-95-14/2-A, Appeals Chamber Judgment, ¶ 63 (ICTY Dec. 17, 2004), https://www.icty.org/x/cases/kordic_cerkez/acjug/en/cer-aj041217e.pdf [<https://perma.cc/99YG-WQHS>] (“Similarly, under Article 85(4)(d) of Additional Protocol I, deliberate attacks on civilian objects such as historic monuments, works of art and places of worship are considered to be grave breaches of the Additional Protocol only insofar as the attack results in extensive destruction.”). This raises the question of whether an attack on physical cultural property, which already has a digital replica sufficiently indistinguishable from the original, would ever amount to a grave breach of the Hague Convention or the Additional Protocols to the Geneva Convention.

233. Yaniv Behamou, *Copyright and Museums in the Digital Age*, WIPO MAG. (June 2016), https://www.wipo.int/wipo_magazine/en/2016/03/article_0005.html [<https://perma.cc/A2Bj-JG9T>]; Brigitte Vezina, *Copyright Law Must Enable Museums to Fulfill Their Mission*, CREATIVE COMMONS, (May 18, 2020), <https://creativecommons.org/2020/05/18/copyright-law-must-enable-museums-to-fulfill-their-mission/> [<https://perma.cc/6BZG-4ESX>].

234. 17 U.S.C. § 106.

235. 17 U.S.C. § 108.

236. Andrea Wallace & Ellen Euler, *Revisiting Access to Cultural Heritage in the Public Domain: EU and International Developments*, 51 INT’L REV. INTELL. PROP. & COMPETITION L. 823, 823 (2020) (“[Reviewing recent EU updates to intellectual property law] reveals that despite the growing consensus for protecting the public domain, there is a lack of practical guidance throughout the EU in legislation, jurisprudence, and literature on what reproduction media might attract new intellectual property rights, from scans to photography to 3D data.”). Additionally, New Zealand copyright law has been a barrier to the digitization of Maori cultural heritage because it restricts the number of copies that

matter where they are located, has been that IP, in particular copyright, has inhibited their ability to carry out their mission and mandate."²³⁷ Domestic IP regimes undercut the assumption that cultural heritage institutions can replicate cultural data *ad infinitum* as a means of eliminating practical threats to digital and digitized cultural property. The intricacies of domestic IP laws cut against any presumption that digital cultural property, wherever located, will have backups, and thus counsels in favor of protecting digital cultural property in the event of an armed conflict.

1. Copyright Law and the Problems It Presents for Digital Cultural Heritage

Current cultural property law regimes impede the replication of digital cultural property. For instance, most digital cultural property is available in encrypted formats, which ties the digital goods to a specific account to prevent duplication; as a result, cultural heritage institutions are capable of licensing these digital goods, but they are unable to create archival copies until the expiration of the copyright.²³⁸ The Digital Millennium Copyright Act makes circumventing these technical measures against duplication a federal crime punishable by up to five years in prison.²³⁹ As a result, GLAMs must often wait ninety-five years after a work's publication—or seventy years after the death of the author—to produce an archival copy,²⁴⁰ by which point the cultural property will likely have been lost to technological obsolescence, degraded hard drives, human error, or malicious attacks.²⁴¹ According to the Library of Congress, this has happened before. Because film studios lacked the resources, the foresight, or the commercial

museums can make and the purposes for which museums can digitize culture property. Susan Corbett, *Archiving Our Culture in a Digital Environment: Copyright Law and Digitisation Practices in Cultural Heritage Institutions* 6, SSRN (Nov. 2011), https://www.researchgate.net/publication/255728239_Archiving_Our_Culture_in_a_Digital_Environment_Copyright_Law_and_Digitisation_Practices_in_Cultural_Heritage_Institutions (on file with the *Columbia Human Rights Law Review*).

237. RINA ELSTER PANTALONY, *MANAGING INTELLECTUAL PROPERTY FOR MUSEUMS* 8 (2013), https://www.wipo.int/edocs/pubdocs/en/copyright/1001/wipo_pub_1001.pdf [<https://perma.cc/MZ3X-CBTC>].

238. Benj Edwards, *The Copyright Rule We Need to Repeal If We Want to Preserve Our Cultural Heritage*, *ATLANTIC MONTHLY* (Mar. 15, 2013), <https://www.theatlantic.com/technology/archive/2013/03/the-copyright-rule-we-need-to-repeal-if-we-want-to-preserve-our-cultural-heritage/274049/> [<https://perma.cc/Q7HU-EEZ8>]. A good example of this kind of cultural work is a streaming service film or television show, which is only available through a consumer account.

239. 17 U.S.C. §§ 1201–1203.

240. 17 U.S.C. § 302.

241. Edwards, *supra* note 238.

incentive to preserve their films for posterity's sake, 75% of all silent films have been lost forever.²⁴² "The Library of Congress can now authoritatively report that the loss of American silent-era feature films constitutes an alarming and irretrievable loss to our nation's cultural record."²⁴³

Copyright holders, as opposed to GLAMs, might produce backups of their work, but that is up to the copyright holder's discretion; a possessive copyright holder might actively hinder any reproductions. Take *Star Wars*, a film included in the Library of Congress's National Film Registry because of its historical and cultural significance.²⁴⁴ Since the theatrical release of *A New Hope* in 1977, George Lucas, and later Disney, made several alterations to the film, including introducing Computer Generated Imagery ("CGI"), adding entirely new scenes, altering the sound mixing and color palette, and including entirely new lines.²⁴⁵ George Lucas has publicly stated that he only wants his updated versions of the film to survive and Disney has continued that policy.²⁴⁶ As a result, the only digital versions of the original cut of *A New*

242. DAVID PIERCE, LIBR. OF CONG., THE SURVIVAL OF AMERICAN SILENT FEATURE FILMS: 1912-1929, at viii (2013), https://www.loc.gov/static/programs/national-film-preservation-board/documents/pub158.final_version_sept_2013.pdf [<https://perma.cc/3MPT-LPDD>]. As many smaller film studios went bankrupt, their films were lost. Additionally, until the 1980s, no film studios, with the exception of MGM, invested in film preservation, and only collaborated with archives on a title-by-title basis. *Id.* at 39-44.

243. *Id.* at viii.

244. *Complete National Film Registry Listing*, LIBR. OF CONG. (NOV. 7, 2021), <https://www.loc.gov/programs/national-film-preservation-board/filmregistry/complete-national-film-registry-listing/> [<https://perma.cc/7FLR-2G29>]. While *Star Wars* and *The Empire Strikes Back* are of such cultural significance that they have been included in the National Film Registry, Lucas has refused to provide the Registry with a copy of the original cut and instead submitted the 2004 special editions, which the Registry refused. *Request Denied: Lucas Refuses to Co-Operate with Government Film Preservation Organizations*, SAVING STAR WARS (2010), <https://www.savestartwars.com/lucas-nfr.htm> [<https://perma.cc/K455-HXEU>].

245. Ben Kirby, *Who Shot First? The Complete List of Star Wars Changes*, EMPIRE (Nov. 28, 2019), <https://www.empireonline.com/movies/features/star-wars-changes/> [<https://perma.cc/T37S-UDRD>]. One noted and controversial change was to the order of blaster fire exchanged at the Mos Eisley Cantina, prompting fans to complain that "Han shot first." *Id.*

246. Ron Magid, *Digital and Analog Special Effects Collide in the Retooled Version of STAR WARS*, AM. SOC. CINEMATOGRAPHERS, Feb. 1997, <https://theasc.com/magazine/starwars/> (on file with the *Columbia Human Rights Law Review*) ("The other versions will disappear. Even the 35 million tapes of Star Wars out there won't last more than 30 or 40 years. A hundred years from now, the only version of the movie that anyone will remember will be the DVD version [of the Special Edition] . . ."); Marcus Glimmer, *Not Even J.J. Abrams Can Make a Re-Release of the Original 'Star Wars' Cuts Happen*, MASHABLE (Dec. 15, 2019), <https://mashable.com/article/jj-abrams-star-wars-theatrical-cut/> [<https://perma.cc/ARG5-5HBR>].

Hope are fan-made and arguably constitute copyright infringement.²⁴⁷ In its current form, copyright places the preservation of cultural heritage at the whims of the copyright holder, making it difficult for belligerents in an armed conflict to presume that they can target digital cultural property haphazardly.

A Library of Congress report on copyright laws from the United Kingdom, Australia, the Netherlands, and the United States concluded that “[a]lthough copyright and related laws are not the only obstacle to digital preservation activities, there is no question that those laws present significant challenges.”²⁴⁸ None of the jurisdictions surveyed have a uniform system for collecting digital materials, none of the exceptions to copyright laws for GLAMs were designed for digital preservation, and exceptions to copyright law for GLAMs are wildly inconsistent across jurisdictions.²⁴⁹ International copyright treaties are of little help in ensuring the preservation of cultural heritage. For example, the Berne Convention and the WIPO Copyright Treaty merely allow for states to permit reproduction “[p]rovided that such reproduction does not conflict with a normal exploitation of the work and does not unreasonably prejudice the legitimate interests of the author.”²⁵⁰ This labyrinth of copyright law makes it legally dubious to rely on random reproductions to protect digital and digitized cultural property.

Finally, the rise in non-fungible tokens (“NFTs”) have made certain copies of digital art unique, and thus irreproducible, through blockchain technology.²⁵¹ NFTs thus make digital goods artificially scarce, causing a boom in digital art while also making some digital cultural property completely unique. In March 2021, Beeple, the online name of Charleston-based artist Mike Winkelmann, sold a digital painting called “Everydays-The

247. Matthew Yglesias, *This Is the Best Version of Star Wars—and Watching It Is a Crime*, VOX (May 12, 2015), <https://www.vox.com/2015/1/30/7952859/despecialized-edition-download> [<https://perma.cc/JPZ5-JYAM>].

248. LIBR. OF CONG. ET AL., INTERNATIONAL STUDY ON THE IMPACT OF COPYRIGHT LAW ON DIGITAL PRESERVATION 154 (July 2008), https://www.digitalpreservation.gov/documents/digital_preservation_final_report2008.pdf [<https://perma.cc/24BL-79A3>]. The same report also noted that “Digital works are ephemeral and unless preservation efforts are begun soon after such works are created, they will be lost to future generations.” *Id.*

249. *Id.*

250. Berne Convention for the Protection of Literary and Artistic Works art. 9(2), May 4, 1896, 828 U.N.T.S. 221.

251. Erin Griffith, *Why an Animated Flying Cat with a Pop-Tart Body Sold for Almost \$600,000*, N.Y. TIMES (Feb. 22, 2021), <https://www.nytimes.com/2021/02/22/business/nft-nba-top-shot-crypto.html> (on file with the *Columbia Human Rights Review*).

First 5000 Days” for \$69.3 million through Christie’s auction house.²⁵² The auction was conducted entirely online and through the cryptocurrency Ethereum.²⁵³ Websites like OpenSea, the world’s largest NFT marketplace, offer NFT creators the chance to buy and sell unique virtual collectibles.²⁵⁴ Because NFTs are so novel, there is no case law on the relationship between NFTs and IP law. This raises complex questions surrounding doctrines such as first sale,²⁵⁵ moral rights,²⁵⁶ and rights of the author.²⁵⁷ The fact that many NFTs are not created by the original author, but by a third party, further challenges existing IP frameworks.

For the purposes of digital cultural property, NFTs ensure the authenticity of a piece of digital art. For example, the *Mona Lisa* is clearly protected cultural property under international law, but prints of da Vinci’s masterpiece sold at the Louvre gift shop are not. NFTs offer an opportunity to authenticate certain works of digital cultural property and accord them protection under LOAC, while rendering non-NFT copies lawful targets. Because an NFT is an inherently unique entry on a blockchain ledger, it cannot be reproduced beyond the quantity specified by the NFT creator.²⁵⁸ As the primary means of ensuring authenticity in digital art, NFTs are likely the future of digital art, and thus ought to be protected under the laws of war.

252. Scott Reyburn, *The \$69 Million Beeple NFT Was Bought with Cryptocurrency*, N.Y. TIMES (Mar. 12, 2021), <https://www.nytimes.com/2021/03/12/arts/beeple-nft-buyer-ether.html> (on file with the *Columbia Human Rights Review*)

253. *Id.* The Ethereum blockchain (which supports the Ether currency), also supports most NFTs in the world now, although there is nothing preventing other blockchains from expanding into NFTs.

254. OpenSea Home Page, OPENSEA (Nov. 7, 2021), <https://opensea.io/> [<https://perma.cc/XWB7-X39N>].

255. 17 U.S.C. § 109.

256. 17 U.S.C. § 106A.

257. Capitol Records, LLC v. ReDigi Inc., 910 F.3d 649, 659 (2d Cir. 2018) (“[O]peration of ReDigi version 1.0 in effectuating a resale result in the making of at least one unauthorized reproduction. Unauthorized reproduction is not protected by § 109(a). It violates the rights holder’s exclusive reproduction rights under § 106(1).”).

258. NBA Top Shot is a good example of this. The website takes NBA highlights, turns video clips of them into NFTs called “moments,” and then sells them on the digital marketplace. Their price is dictated by the highlight itself, the quantity of that “moment” produced, the rarity of the “moment,” and the serial number of that “moment.” For instance, a dunk by Lakers forward LeBron James against the Sacramento Kings on November 15, 2019 is currently selling for \$535,000. LeBron James Holo MMXX (Series 1), NBA TOP SHOT (Nov. 9, 2021), <https://www.nbatopshot.com/listings/p2p/814c5183-596f-41d7-9135-c6b29faa9c6d+de32d3fb-0e6a-447e-b42a-08bbf1607b7d> [<https://perma.cc/774Q-2HDL>].

D. How to Protect Digital Cultural Property in Practice

The question remains of how to ensure the Hague Convention and its Additional Protocols, as well as the Geneva Convention and its Additional Protocols, carry weight. One idea might be technical solutions. Articles 16 and 17 of the 1954 Hague Convention establish a distinctive marking to identify physical cultural property and to provide notice to all parties of the property's protected status.²⁵⁹ This could easily be adapted into a number of technical solutions, including file naming conventions and coding schemes to tag cultural data.²⁶⁰ Militaries have already developed no-strike lists for culturally significant sites, which prevented the destruction of ancient monuments by Coalition Forces during the First Gulf War and the 2011 Libya Intervention.²⁶¹ Such no-strike lists might extend to certain servers, data centers, or IP addresses housing culturally significant data. Additionally, a published register of IP addresses, analogous to already-extant national or international registers of cultural property, would help provide notice and further remove cultural property from hostilities in cyberspace.²⁶² By segregating the civilian internet from the locus of military operations, states can better preserve digital cultural property in an armed conflict. At a minimum, states ought to ensure digital cultural data is preserved through at least some basic cybersecurity provisions as a means of fulfilling their peacetime obligations under Article 3 of the 1954 Hague Convention.²⁶³

International collaboration is also key to preserving digital cultural property. As part of their peacetime obligations under the 1954 Hague Convention, public cultural agencies and ministries could collaborate

259. 1954 Hague Convention, *supra* note 48, at arts. 16–17.

260. TALLINN MANUAL 2.0., *supra* note 4, at 536.

261. Kastenberg, *supra* note 31 at 277, 297; Petty Gerstenblith, *Beyond the 1954 Hague Convention*, in CULTURAL AWARENESS IN THE MILITARY: DEVELOPMENTS AND IMPLICATIONS FOR FUTURE HUMANITARIAN COOPERATION 83, 90 (Robert Albro & Bill Ivey eds., 2014), https://www.wellesley.edu/sites/default/files/assets/departments/religion/images/gerstenblith_beyond_the_1954_hague_convention.pdf [<https://perma.cc/EJQ4-CDXP>] (highlighting the role a no-strike list may have played in protecting Libyan cultural heritage sites from destruction during the 2011 Libya Intervention).

262. See, e.g., 54 U.S.C. § 3021 (establishing the National Register of Historic Places); *World Heritage List*, UNESCO (Nov. 7, 2021), <https://whc.unesco.org/en/list/> [<https://perma.cc/SC4C-MVSF>]; Geoffrey Scott, *The Cultural Property Laws of Japan: Social, Political, and Legal Influences*, 12 WASH. INT'L L.J. 316, 385 (2003) (explaining the three basic categories of cultural properties protected under a draft of the Cultural Property Protection Bill).

263. See MATTHEW KIRSCHENBAUM ET AL., COUNCIL ON LIBR. & INFO. RES., DIGITAL FORENSICS AND BORN-DIGITAL CONTENT IN CULTURAL HERITAGE COLLECTIONS 59–64 (2010) (proposing a number of policies to protect born-digital data, including collaborating with digital cultural producers, firewalls, and employee training).

through UNESCO to track digitization projects.²⁶⁴ The 2003 UNESCO Charter on the Preservation of Digital Cultural Heritage is a good starting point,²⁶⁵ but further investments in digital literacy, innovation, and civil society organizations would aid the shift from analog to digital.²⁶⁶ Collaboration with such civil society groups on military training, similar to what the U.S. Committee of the Blue Shield already does with U.S. Civil Affairs troops deployed abroad,²⁶⁷ can ensure formal armed forces conduct cyber operations while respecting digital cultural property.

When responding to attacks on cultural property, states might also collaborate to overcome the difficulties of attribution in cyberspace. Because of technical advancements in recent years, successfully attributing major cyberattacks to individual perpetrators has gone from impossible to probable.²⁶⁸ By establishing an international evidentiary standard for cyberattack attribution, states can legitimately deter hostile states and ensure legal liability for law-breaking individuals.²⁶⁹ Additionally, states might share evidence with each other, or in collaboration with the private sector, as part of an international attribution mechanism.²⁷⁰ While such

264. *Cutting Edge: Protecting and Preserving Cultural Diversity in the Digital Era*, UNESCO (Oct. 28, 2020), <https://en.unesco.org/news/cutting-edge-protecting-and-preserving-cultural-diversity-digital-era> [<https://perma.cc/PEU9-NLGJ>] (“Without data on the cultural sector, it will prove difficult to design policies that respond to the real needs of the sector at national level, or even lead to counter-productive policies.”).

265. UNESCO, *supra* note 3.

266. See Octavio Kulesz, *Cultural Policies in the Age of Platforms*, in *RESHAPING CULTURAL POLICIES: ADVANCING CREATIVITY FOR DEVELOPMENT* 69 (Danielle Cliche et al. eds., 2017) (discussing policies to promote cultural expression in a digital world and reviewing efforts to implement the 2005 UNESCO Convention on the Protection and Promotion of the Diversity of Cultural Expressions).

267. Gerstenblith, *supra* note 261, at 88–89.

268. Kristen E. Eichensehr, *The Law and Politics of Cyberattack Attribution*, 67 *UCLA L. REV.* 520, 531–32 (2020) (describing how the United States has made public attributions in recent years through criminal indictments, economic sanctions, and official press releases and suggesting that legal obstacles, not technical ones, constitute the remaining hurdles in attributing major cyberattacks); Delbert Tran, *The Law of Attribution: Rules for Attributing the Source of a Cyber-Attack*, 20 *YALE J. L. & TECH.* 376, 392 (2018) (“[C]omputer scientists have developed a range of tools to trace cyber-attacks, and empirically, large-scale state attacks tend to leave behind enough footprints (or circumstantial evidence) to lead forensic experts to their source.”); David Clark & Susan Landau, *Untangling Attribution*, 2 *HARV. NAT’L SEC. J.* 531, 560 (2011) (contending that “the most important barriers to deterrence today are not poor technical tools for attribution, but issues that arise due to cross-jurisdictional attacks, especially multi-stage attacks. In other words, deterrence must be achieved through the governmental tools of state and not by engineering design.”).

269. Eichensehr, *supra* note 268, at 554–56, 566.

270. Yuval Shany & Michael Schmitt, *An International Attribution Mechanism for Hostile Cyber Operations*, 96 *INT’L L. STUD.* 196, 215–18 (2014).

proposals have largely focused on *jus ad bellum* concerns, attribution is equally critical to *jus in bello* issues, such as protecting cultural property.²⁷¹

The COVID-19 pandemic has made protections for digital cultural property all the more salient. In April 2020, 130 ministers of culture from around the world met virtually through Zoom to discuss the impact of the pandemic on the culture sector.²⁷² During the pandemic, “86% of countries . . . closed or partially closed their World Heritage Sites and 90% of museums . . . were closed.”²⁷³ Saudi Arabia, India, Colombia, Estonia, Greece, Albania, and Belize all emphasized the need to transition to digital cultural platforms and provide financial support for digital cultural production.²⁷⁴ “A large share of countries, including Kenya, Mexico and Lithuania, have made the digital transition one of the cornerstones of their cultural policy . . .”²⁷⁵ while other states, such as Serbia, Botswana, Cyprus, and Andorra questioned how this digital transformation would affect copyright protections.²⁷⁶ There was a general consensus among states that “[t]he digital transition must be the subject of global reflection and international regulation,”²⁷⁷ and that the digital cultural transition would certainly accelerate moving forward.²⁷⁸

CONCLUSION

By framing digital and digitized cultural property as archives and records, existing international treaties can provide some degree of legal protection to this rapidly growing form of cultural heritage. This protection is particularly valuable, given the lack of an international effort to expand cultural heritage protections in the law of armed conflict. Because of the lack of a political will to create a new treaty for cultural property in cyberspace, states, international organizations, and scholars should further pursue novel interpretations to protect cultural heritage and adjust their policies

271. Gervais, *supra* note 102, at 544–50.

272. UNESCO, Online Meeting of Ministers of Culture: Impact of the Covid-19 Pandemic on the Cultural Sector and the Public Policy Response, U.N. Doc. CLT/CPD/2020/RP/H/1 (Apr. 22, 2020), <https://unesdoc.unesco.org/ark:/48223/pf0000373601> [<https://perma.cc/YJD7-LA5E>].

273. *Id.* at 11.

274. *Id.* at 12–14, 18.

275. *Id.* at 19.

276. *Id.*

277. UNESCO, *supra* note 272, at 29.

278. UNESCO, Online Meeting of Ministers of Culture: Impact of the Covid-19 Pandemic on the Cultural Sector and the Public Policy Response, at 18, U.N. Doc. CLT/CPD/2020/RP/H/1 (Apr. 22, 2020) <https://unesdoc.unesco.org/ark:/48223/pf0000373601> [<https://perma.cc/YJD7-LA5E>].

respectively. As digital culture becomes increasingly prominent during the COVID-19 pandemic and beyond, so too will the international legal issues which surround digital cultural property and heritage. Through new interpretations and norms, international law can continue to protect cultural property further into the twenty-first century.

The emergence of digital cultural property raises further interesting questions surrounding international human rights law and its intersection with cultural heritage and cyberspace. To the extent that participation in cultural life creates a human right to cultural heritage,²⁷⁹ and insofar as internet access is a human right,²⁸⁰ protections for digital cultural property might also emerge from international human rights law, in addition to international humanitarian law. The use of an international human rights framework could bolster protections for digital cultural heritage in peacetime to a greater degree than international humanitarian law. Raising interesting questions surrounding privacy, sovereignty, intellectual property, and the freedom of expression, the use of a human rights

279. International Covenant on Economic, Social and Cultural Rights art. 15, *opened for signature* Dec. 16, 1966, 993 U.N.T.S. 3, 9 (“The States Parties to the present Covenant recognize the right of everyone: (a) To take part in cultural life . . .”); Kimberly Alderman, *The Human Right to Cultural Property*, 20 MICH. ST. INT’L L. REV. 69, 72 (2011); G.A. Res. 217 (III) A, Universal Declaration of Human Rights art. 27(1), at 75 (Dec. 10, 1948) (“Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits.”); Human Rights Council Res. 33/20, ¶ 1, U.N. Doc. A/HRC/RES/33/20 (Sept. 30, 2016) (“Calls upon all States to respect, promote and protect the right of everyone to take part in cultural life, including the ability to access and enjoy cultural heritage . . .”); UNESCO, DECLARATION CONCERNING THE INTENTIONAL DESTRUCTION OF CULTURAL HERITAGE, annex, Oct. 17 2003, http://portal.unesco.org/en/ev.php-URL_ID=17718&URL_DO=DO_TOPIC&URL_SECTION=201.html [https://perma.cc/9QEY-W4JX] (“Mindful that cultural heritage is an important component of the cultural identity of communities, groups and individuals, and of social cohesion, so that its intentional destruction may have adverse consequences on human dignity and human rights.”).

280. *Report of the Special Rapporteur on the Promotion and Protection of the Right to Freedom of Opinion and Expression*, ¶ 85, U.N. Doc. A/HRC/17/27 (May 16, 2011) (“Given that the Internet has become an indispensable tool for realizing a range of human rights, combating inequality, and accelerating development and human progress, ensuring universal access to the Internet should be a priority for all States.”); G.A. Res. 217 (III) A, Universal Declaration of Human Rights, art. 19, at 74 (Dec. 10, 1948) (“Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers.”); Human Rights Council Res. 32/13, U.N. Doc. A/HRC/32/L.20, at 3 (June 27, 2016) (“Affirms that the same rights that people have offline must also be protected online, in particular freedom of expression, which is applicable regardless of frontiers and through any media of one’s choice . . .”).

framework to protect digital cultural heritage and property is a promising subject for future research.