
1-31-2021

“Due Regard” for Commercial Space Must Start with Historic Preservation

Michelle Hanlon

The University of Mississippi School of Law

Follow this and additional works at: <https://engagedscholarship.csuohio.edu/gblr>

 Part of the [Air and Space Law Commons](#)

[How does access to this work benefit you? Let us know!](#)

Recommended Citation

Michelle Hanlon, *“Due Regard” for Commercial Space Must Start with Historic Preservation*, 9 Global Bus. L. Rev. 130 (2021)
available at <https://engagedscholarship.csuohio.edu/gblr/vol9/iss1/6>

This Article is brought to you for free and open access by the Journals at EngagedScholarship@CSU. It has been accepted for inclusion in The Global Business Law Review by an authorized editor of EngagedScholarship@CSU. For more information, please contact library.es@csuohio.edu.

“DUE REGARD” FOR COMMERCIAL SPACE MUST START WITH HISTORIC PRESERVATION

MICHELLE HANLON

Abstract	130
I. Introduction	131
II. Protecting Human Heritage	134
A. The Greatest Archaeological Rescue Operation of All Time	134
B. The World Heritage Convention Protects Outstanding Universal Value.....	135
C. Sites of Outstanding Universal Value on the Moon?	138
III. The Outer Space Treaty Regime	142
A. Shaped by Cold War and Uncertainty.....	142
B. Non-Appropriation, Ownership and Due Regard.....	143
C. Understanding Due Regard	147
D. Safety Zones.....	148
IV. A New Approach	151
A. History at Risk	151
B. So, Put History First.....	152
V. Conclusion	155

Abstract

Today we rely on the concept of “due regard” to protect our assets – and heritage – in space. Enshrined in Article IX of the Outer Space Treaty “due regard” has no legal definition. Nor has its breadth or scope been rigorously tested in court or in any public diplomatic dispute. And so, we blithely promise each other to conduct all activities in space “with due regard to the corresponding interests of others.” Meaning we pursue our activities with the fervent hope that no one will interfere, whether accidentally or intentionally. This is an untenable state of affairs. It is compounded by the fact that it has recently proven difficult for the international community to agree on space governance matters.

This article addresses the concept of due regard as it affects space commerce. Specifically, this article will explore the best way to reach agreement on how spacefaring entities must behave with respect to each other when engaged in activities in space and on other celestial bodies. It is argued that the best path forward is to embrace cultural artifacts and sites in space as objects and areas of universal value, worthy of protection through multilateral agreement. Once the international community agrees on sites that deserve special recognition and protective treatment, that

agreement can be adopted as a baseline to establish recognizable norms for meeting the due regard standard imposed by the Outer Space Treaty. To support this argument, the article: discusses the importance of protecting cultural heritage and draws attention to efforts implemented on Earth; provides a review of the international space law regime; and outlines a new approach to the implementation of a governance model for space.

I. Introduction

The date was September 14, 1959. Sergei Korolev, a Soviet Aerospace engineer, was listening anxiously with his team to the signals being sent back to Earth from a spacecraft dubbed Luna 2. Just after midnight, the signals ceased. -- “The total silence meant that Luna had hit its target.”¹

When it impacted the Moon, it became the first ever human-made object to impact another celestial body, as well as the first extraterrestrial human heritage site. While not as heralded as the flight of Sputnik 1, the first human-made object to orbit the Earth,² the success of Luna 2 certainly heightened a sense of urgency within the international community in general, and especially with respect to the Cold War superpowers – the United States (U.S.) and United Soviet Socialist Republics (U.S.S.R. or Soviet Union) – to establish guidelines to govern the exploration and use of space by States.

Much to the credit of diplomacy, the United Nations General Assembly adopted a Declaration of Legal Principle Governing the Activities of States in the Exploration and Use of Outer Space in 1963.³ The Declaration captured nine important principles that were ultimately

¹ Richard Cavendish, *The Soviet Union is First to the Moon*, 59 HISTORY TODAY 9 (Sept. 2009), <https://www.historytoday.com/archive/soviet-union-first-moon>

² Sputnik 1, which launched on October 4, 1957, is widely celebrated as the dawn of the space age, and most certainly the “kick-off” of the space race between the United States and the Soviet Union. See Mike Wall, *Sputnik 1! 7 Fun Facts About Humanity’s First Satellite*, SPACE.COM (Oct. 4, 2020), <https://www.space.com/38331-sputnik-satellite-fun-facts.html>

³ G.A. Res. 1962 (XVIII) (Dec. 13, 1963).

carried into the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies⁴ (“the Outer Space Treaty”), ratified in 1967. The Outer Space Treaty is quite often referred to as the *Magna Carta* of space and indeed, as its name suggests, it offers only Guidelines and Principles – general “ground rules”⁵ – rather than clear and specific rules and regulations. Thus, it is not surprising that the Treaty contains many gray areas, gaps, and internal inconsistencies.

These aforementioned lacunae generate uncertainty regarding State and private rights with respect to activity on the Moon and other celestial bodies. This is significant because humans are (finally) planning to return to the Moon. Leonard David calls it a Moon “rush.”⁶ In addition to Russia, which plans to send Luna-25 to the Moon in 2021,

NASA is orchestrating the Artemis program of robotic and human lunar exploration, due to launch human explorers in 2024 at the earliest. China is preparing to hurl a sample-return mission to the moon this year [2020], joining a Chinese lander and rover that are now on the lunar far side. Other nations, such as Japan and India, as well as private spaceflight firms, also have future lunar exploration in their crosshairs.⁷

⁴ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, *adopted* Oct. 10, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 (hereinafter Outer Space Treaty).

⁵ Valentina Vecchio, *Customary International Law in the Outer Space Treaty: Space Law as Laboratory for the Evolution of Public International Law*, 3 GERMAN J. OF SPACE LAW 66, 501 (2017).

⁶ Leonard David, *Luna-25 Lander Renews Russian Moon Rush*, SCIENTIFIC AMERICAN (Aug. 27, 2020), <https://www.scientificamerican.com/article/luna-25-lander-renews-russian-moon-rush/>

⁷ *Id.* Planned lunar missions by private entities include “Astrobotic’s Peregrine lander launch in June 2021, Intuitive Machines’ following shortly after in October 2021, [Masten Space Systems] set for December 2022 and Astrobotic’s VIPER launch of its larger Griffin lander in 2023.” Darrell Etherington, *SpaceX Will Launch Masten’s First Lander to the Moon in 2022*, TECHCRUNCH (Aug. 26, 2020), <https://techcrunch.com/2020/08/26/spacex-will-launch-mastens-first-lander-to-the-moon-in-2022/>. The Japanese firm, ispace, is also planning a Moon landing mission slated for 2022. Mitsuru Obe, *Japan’s ispace Aims to be ‘Gateway’ for Lunar Business Activity*, NIKKEI ASIA (Aug. 20, 2020), <https://asia.nikkei.com/Business/Aerospace-Defense/Japan-s-ispace-aims-to-be-gateway-for-lunar-business-activity>.

These return missions are about far more than bragging rights and science.

Geological surveys have previously shown that the Moon contains three crucial resources: water, helium-3, and rare earth metals. Water is vital for supporting life and agriculture in space and can be converted into rocket fuel to propel mankind further toward the stars, and helium-3 is a rare helium isotope that could be used for innovations in the energy sector – namely nuclear fusion. Rare earth metals are vital in emerging technologies, as well as the technologies we make use of every day, from smartphones and computers to medical equipment.⁸

While actual lunar mining may be decades away, the fact that the Moon may contain such valuable resources that States, and entities may seek to utilize means that there will soon be a lot more objects on our neighboring celestial body. In consequence, conflict is inevitable. This increased activity will test the principles of the Outer Space Treaty and particularly challenge the inconsistencies within space's *Magna Carta*.

This article will address the largest lacuna in international space law, as it effects space commerce. Specifically, this article will explore how spacefaring entities must behave with respect to each other when engaged in activities in space and on other celestial bodies. The author submits that the best way to solve this issue is to identify sites that the international community can agree need special recognition and use that agreement as a baseline to establish recognizable norms for meeting the due regard standard imposed by the Outer Space Treaty. Part II discusses the importance of protecting cultural heritage and draws attention to efforts implemented on Earth. Part III provides a review of the international space law regime. Part IV outlines a new approach to the implementation of a governance model for space, and Part V offers some concluding thoughts.

⁸ Matthew Hall, *Lunar Gold Rush: Can Moon Mining Ever Take Off?*, MINING TECHNOLOGY (July 2, 2020), <https://www.mining-technology.com/features/moon-mining-what-would-it-take/>.

II. Protecting Human Heritage

A. The Greatest Archaeological Rescue Operation of All Time

It was described as an “agonizing dilemma.”⁹ In April 1959, the Egyptian Minister of Culture contacted the United Nations Educational Scientific and Cultural Organization (“UNESCO”)¹⁰; Egypt needed help. In order to promote and accelerate its industrialization and the modernization of its economy, Egypt needed to harness the power of the Nile River.¹¹ Unfortunately, the plan to build what is now known as the Aswan High Dam would result in the creation of a vast lake. A lake which would assure the obliteration of 3,000 year-old temples and monuments – footprints of an ancient civilization known as Nubia.¹² In October of that same year, the Republic of Sudan sent a similar plea to UNESCO.¹³ Neither country had the money nor the capability to protect these historic sites.

The response was swift. UNESCO spearheaded a global international effort to rescue the Nubian heritage that its Director-General, Vittorino Veronese, knew humanity could not afford to lose. As Veronese himself noted,

1. It is not easy to choose between heritage and the present well-being of people.
2. Treasures of unrivalled value are entitled to universal protection.
3. The rescue operations will not just preserve something which may otherwise be lost but will, in addition, bring to light to as yet undiscovered wealth for the benefit of all.¹⁴

⁹ Vittorino Veronese, *A Message from the Director-General of UNEASCO*, THE UNESCO COURIER, Feb. 1960, at 3.

¹⁰ Fekri A. Hassan, *The Aswan High Dam and the International Rescue Nubia Campaign*, 24 THE AFR. ARCHAEOLOGICAL REV., 73, 79 (Sept./Dec. 2007).

¹¹ *Id.* at 75.

¹² Veronese, *supra* note 9.

¹³ Hassan, *supra* note 10 at 82.

¹⁴ *Id.* at 80.

It became the greatest archaeological rescue operation of all time. Even as humans waged a bitterly Cold War, raced to the Moon, and fought for civil rights, the call to preserve our history was not ignored. It is estimated that \$80 million USD was raised from 47 UNESCO-member nations and a number of private entities from around the globe.¹⁵ International panels of experts from five continents convened to develop and implement strategies for saving 23 temples and architectural complexes; some of which were even relocated brick by brick.¹⁶ In short, the international community came together to save treasures they recognized belonged to humanity as a whole, not just to Egypt or the Republic of Sudan, but to humanity as a whole.

In the words of another historic UNESCO Director-General Amadou-Mahter M'Bow, the International Rescue Nubia Campaign “will be numbered among the few major attempts made in our lifetime by the nations to assume their common responsibility towards the past so as to move forward in a spirit of brotherhood towards the future.”¹⁷

B. The World Heritage Convention Protects Outstanding Universal Value

The success of the Nubia Campaign spawned other campaigns to save monuments of universal value, including: among others, Venice and its Lagoon in Italy, the Archaeological Ruins of Moenjodaro in Pakistan, and the Borobodur Temple Compounds in Indonesia.¹⁸ More importantly, the Nubia Campaign created the foundation for an international convention on

¹⁵ *Id.* at 83-84.

¹⁶ *Id.* at 84.

¹⁷ Amadou-Mahtar M'Bow, *Victory in Nubia: The Greatest Archaeological Rescue Operation of All Time*, THE UNESCO COURIER, 4 (March 1980). M'Bow is the Director-General of UNESCO.

¹⁸ Hasan, *supra* note 10 at 89.

world heritage; a convention that builds and strengthens what the Honorable Russell E. Train¹⁹ identified as “a sense of kinship with one another as part of a single, global community.”²⁰

The Convention, formally titled the “Convention Concerning the Protection of the World Cultural and Natural Heritage,”²¹ was adopted on November 16, 1972. With 194 States Parties, the Convention is one of the most-ratified international treaties.²² In other words, nearly every nation on Earth agrees “that deterioration or disappearance of any item of the cultural or natural heritage constitutes a harmful impoverishment of the heritage of all the nations of the world”²³, and that collective effort must be undertaken to protect cultural heritage of “outstanding universal value.”²⁴

The World Heritage Convention defines cultural heritage as, among other things “works of [hu]man or the combined works of nature and [hu]man, and areas [that include] archaeological sites which are of outstanding universal value from the historical, aesthetic, ethnological or anthropological point of view.”²⁵ Outstanding universal value is further defined as having significance “which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity. As such, the permanent

¹⁹Train has been called a “founding father of the World Heritage Convention,” United Nations Educational, Scientific and Cultural Organization, *The Director-General Pays Tribute to Leading US Conservationist and One of the Fathers of the World Heritage Convention*, UNESCO (Sept. 19, 2012) <https://whc.unesco.org/en/news/939>

²⁰ United Nations Educational, Scientific and Cultural Organization, *Abu Simbel: The Campaign That Revolutionized the International Approach to Safeguarding Heritage*, UNESCO (Sept 19,2012), https://en.unesco.org/70years/abu_simbel_safeguarding_heritage

²¹ Convention Concerning the Protection of the World Cultural and Natural Heritage, *adopted* Nov. 16, 1972, 27 U.S.T. 37, 1037 U.N.T.S. 151 [hereinafter World Heritage Convention].

²² United States Educational, Scientific and Cultural Organization, States Parties & Ratification Status, UNESCO (last accessed Oct. 23, 2020), <https://whc.unesco.org/en/statesparties/>

²³ World Heritage Convention, *supra* note 4 at Preamble.

²⁴ *Id.*

²⁵ *Id.* art. 1.

protection of this heritage is of the highest importance to the international community as a whole.²⁶”

The Operational Guidelines for the Implementation of the World Heritage Convention²⁷ (“Heritage Guidelines”) provides even more specific guidance. In order to be considered to have Outstanding Universal Value, the site or property must meet one or more of ten specific criteria, including:

- (i) represent a masterpiece of human creative genius
- (ii) exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;
- (iii) bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared;
- (iv) be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;²⁸

Moreover, the Heritage Guidelines anticipate the recognition of cultural landscapes:

“[c]ultural properties [that] represent the ‘combined works of nature and [hu]man . . . [that] are illustrative of the evolution of human society and settlement over time, under the influence of physical constraints”²⁹

²⁶ Natalie Prolman *Why we need to protect our cultural heritage sites* GLOBAL CITIZEN (May 21, 2015) <https://www.globalcitizen.org/en/content/why-we-need-to-protect-our-cultural-heritage-sites/>

²⁷ UNESCO World Heritage Center, *Operational Guidelines for the Implementation of the World Heritage Convention*, UNESCO, at ¶ 49, (July 10, 2019).

²⁸ *Id.* ¶77.

²⁹ *Id.* ¶47.

C. Sites of Outstanding Universal Value on the Moon?

It is estimated that there are more than 100 sites on the Moon that host evidence of human behavior.³⁰ Each site bears witness to humankind's ingenuity and confirms our species as "natural wanderers, the inheritors of an exploring . . . bent that is deeply embedded in our evolutionary past."³¹ While this predisposition to explore is not unique to homo sapiens, "[w]hat makes us different from other expansionary species is our ability to adapt to new habitats through technology: We invent tools and devices that enable us to spread into areas for which we are not biologically adopted."³²

Cultural Heritage Academic, Dirk Spanneman suggests that human evolution can be sketched as a sequence of technological and psychological developments.³³ Of course, it starts with the ability to walk on two limbs instead of four, freeing hands to craft tools and carry those tools, as well as food, from place to place. Other milestones include:

overcoming the fear of fire innate to animals and developing control of it as a tool (some 300,000 years ago); overcoming the fear of stretches of open water innate to primates (some 60,000+ years ago); transmission of complex thought by means of language (some 30,000 years ago as evidenced by complex rock art); becoming cognizant of not being controlled by nature but of our own ability to control it (through domestication of animals and plants, some 9000–12,000 years ago); and being [cognizant] of our ability to destroy our planet (first deployment of an atomic bomb, 1945).³⁴

³⁰ Michelle L.D. Hanlon, *Apollo 11 Brought a Message of Peace to the Moon – but Neil and Buzz Almost Forgot to Leave it Behind*, THE CONVERSATION (Mar. 26, 2019), <https://theconversation.com/apollo-11-brought-a-message-of-peace-to-the-moon-but-neil-and-buzz-almost-forgot-to-leave-it-behind-112851#:~:text=More%20than%20one%20hundred%20sites&text=There%20are%20more%20than%20a,experimen%20ts%20they%20hold%20invaluable%20data>

³¹ Ben R. Finney & Eric M. Jones, *The Exploring Animal*, in INTERSTELLAR MIGRATION AND THE HUMAN EXPERIENCE 15, 15 (Ben R. Finney & Eric M. Jones, eds., 1985).

³² *Id.*

³³ Dirk H.R. Spennemann, *The Ethics of Treading on Neil Armstrong's Footprints*, 20 SPACE POLICY 279, 283 (2004).

³⁴ *Id.*

“Having humans leaving this planet and stepping onto Moon,” Spanneman continues, “ranks among these key developments.”³⁵

Even more, throughout our evolution, humans have compounded our learning across cultures and centuries, developing and perfecting tools as they are distributed through diverse societies.³⁶ This is shown by the cultural artifacts we have discovered around the globe. For example, the Ishango bone, a 20,000-year-old baboon fibula, was recovered in what is today the Democratic Republic of the Congo.³⁷ Originally believed to be just a tally stick, the three columns of deliberate marks running its length, are now thought to indicate an understanding of various mathematical relationships, and are perhaps “the first tool upon which some logic reasoning seems to have been done.”³⁸ Humans would not have made it to be Moon without developing this mathematical knowledge and understanding..

Similarly, while little is known about the first attempts to make glass, it is generally believed that glassmaking was discovered at least 4,000 years ago in Mesopotamia.³⁹ Glass is not only used in arts but also lenses and optics. It is crucial for observational astronomy, not to mention windows and spacesuit helmets. In short, whether originating in the United States, Russia, China, Japan or any other one of the handful of nations that are truly spacefaring, spaceflight would not have occurred without the earliest innovations of our common ancestors

³⁵ *Id.*

³⁶ The author would like to thank Dr. Marlene Losier for sharing her as yet unpublished research on heritage segmentation and human activity on the Moon. Both of the examples mentioned in the text originated with her analysis. The results of her work will be available through the website forallmoonkind.org in 2021. Marlene Losier, *Heritage Segmentation and Human Activity on the Moon* (forthcoming 2021).

³⁷ Ross Pomeroy, *Is the 20,000-Year-Old Ishango Bone the Earliest Evidence of Logical Reasoning?*, REALCLEARSCIENCE (Nov. 23, 2015), https://www.realclearscience.com/blog/2015/11/the_earliest_evidence_of_logical_reasoning.html

³⁸ *Id.*, quoting Vladimir Pletser of the European Space Research and Technology Centre.

³⁹ HISTORY OF GLASS, (last accessed Nov. 15,2020), <http://www.historyofglass.com/>.

and the curious intellect of stargazers, with names like Galileo, Copernicus, Ibn al-Haytham, Friedrich George Wilhelm Struve, and countless others whose names have been forgotten by time.

Surely, every landing site on the Moon, soft or otherwise, is a memorial to centuries of human perseverance and ingenuity. Each site deserves consideration as exhibiting “outstanding universal value.” To one, they “represent a masterpiece of human creative genius . . . exhibit an important interchange of human values over a span of time . . . bear a unique testimony to a civilization [ours] which is living . . . and [are] an outstanding example of a . . . technological ensemble or landscape which illustrates (a) significant stage[] in human history.”⁴⁰

Of course, humanity’s greatest technological achievements – putting not just one, but twelve of our own on the Moon and bringing them home safely – are memorialized on the lunar surface. There, six Apollo missions left behind everything from lunar modules and scientific experiments to mementos and photos, all globally symbolic and personal. For example, Apollo 11 astronauts Neil Armstrong and Buzz Aldrin left a golden olive branch and a tiny disc containing messages of peace from 94 nations; Apollo 16 astronaut Charlie Duke left a photo of his family. The Apollo sites are a veritable treasure trove of insight into human culture, ingenuity, evolution and society.

Archaeologists tell us that “the Apollo landing sites are not only significant because of their importance to scientific achievement, but also because they are the only sites in human history that have sat frozen in time.”⁴¹ Indeed: the “lack of atmospheric conditions on the Moon

⁴⁰ Operation Guidelines, *supra* note 28, at ¶77.

⁴¹ Joseph Reynolds, *Legal Implications of Protecting Historic Sites in Space*, in *ARCHAEOLOGY AND HERITAGE OF THE HUMAN MOVEMENT INTO SPACE* 111, 112 (Beth Laura O’Leary & P.J. Capelotti eds., 2015).

[have] created . . . almost perfectly preserved site[s] because [they have] dealt with little interference since” humans last left the Moon in 1972.”⁴²

Comparable sites on Earth are well-recognized and protected. In Laetoli, Tanzania, a trail of about 70 footprints, believed to be the oldest footprints of early bipedal humans are recognized as part of the Ngorongoro Conservation Area as a World Heritage site⁴³ having “outstanding universal value.” In the Vézère Valley in France, Lascaux cave is among a network of caves preserved because, among other things, it showcases drawings made by our prehistoric ancestors.⁴⁴ In total, there are currently 1,121 properties spread over 167 nations that are recognized on the World Heritage List.⁴⁵

It is noteworthy that recognition and protection, pursuant to the World Heritage List, do not operate in a vacuum. In fact, as noted, the genesis of the World Heritage concept was found in the need to balance the development of Egypt with the protection of Nubian heritage. Thus, in every case, “there is need to have a holistic approach in order to retain the outstanding universal values of the property while addressing the needs of communities from conceptual processes to operationalization.”⁴⁶ In short, protecting human history in space is not anti-development.

⁴² *Id.*

⁴³ United Nations Educational, Scientific and Cultural Organization, *Ngorongoro Conservation Area*, UNESCO (last accessed Nov. 15, 2020), <https://whc.unesco.org/en/list/39>

⁴⁴ United Nations Educational, Scientific and Cultural Organization, *Prehistoric Sites and Decorated Caves of the Vézère Valley*, UNESCO (last accessed Nov. 15, 2020), <https://whc.unesco.org/en/list/85>.

⁴⁵ United Nations Educational, Scientific and Cultural Organization, *World Heritage List*, UNESCO (last accessed Nov. 15, 2020), <https://whc.unesco.org/en/list/>.

⁴⁶ World Heritage Committee, 43rd Session, Item 7 of the Provisional Agenda, 35 (June 30-July 10, 2019). It is also worth mentioning that designation as a World Heritage Site also can benefit the local economy through increased tourism. While this author believes that lunar tourism will become quite popular in the future, this article will not address the benefits of tourism as the cost alone will prohibit mass tourism. Ultimately, another reason to recognize or protect certain landing sites is to assure that they are not plundered by the very wealthy few so that one day, anyone may be able to draw inspiration from the sites of these incredible achievements.

Indeed, a by-product of such protection will be to lay the foundation for the certainty entities need to move forward in the development of a thriving space economy.

Though the process by which a site is designated World Heritage is not perfect, it is rigorous and necessary. A State must first prepare a nomination file which, in the case of cultural heritage, is evaluated by the International Council on Monuments and Sites (ICOMOS). Once nominated and positively evaluated, it is sent to the World Heritage Committee, which meets once a year to decide which sites will be inscribed on the World Heritage List.⁴⁷ Unfortunately for heritage sites located in space, a nominated property must occur “on the territory of a single State Party, or . . . on the territory of all concerned States Parties having adjacent borders.”⁴⁸ As discussed below, the terms of the Outer Space Treaty preclude the possibility of nomination through this process.

III. The Outer Space Treaty Regime

A. Shaped by Cold War and Uncertainty

The Outer Space Treaty is not a long document. Negotiated during the Cold War by the world’s two superpowers, the document reflects a remarkable *détente*: even as they raced each other to “slip the surly bonds of [E]arth,”⁴⁹ they endeavored to preserve peace in the heavens. Yet as prescient as the negotiators were, they could not have begun to imagine an environment where, as today, private entities could perform all the space activities once reserved for State actors – and very few State actors at that. As a result, peace, collaboration and freedom⁵⁰ are the

⁴⁷ Operation Guidelines, *supra* note 28, at ¶¶ 120-168.

⁴⁸ *Id.* at ¶ 134.

⁴⁹ John Gillespie Magee, Jr., *High Flight*, NATIONAL POETRY DAY (last accessed Nov. 15, 2020), <https://nationalpoetryday.co.uk/poem/high-flight/>

⁵⁰ The first Article encompasses three foundational aspects of all space activities: the exploration and use of space is the “province” of all humankind; space, including the Moon and other celestial bodies “shall be free for exploration

Treaty's key principles, while more mundane matters, including cultural heritage preservation and private resource mining and utilization, are unaddressed.

That said, the activities of private entities are not entirely overlooked. Article VI of the Treaty makes it quite clear that States bear “international responsibility for national activities in outer space . . . whether such activities are carried on by governmental agencies or by non-governmental entities.”⁵¹ The Article further indicates that States must assure that all “national activities are carried out in conformity with the provisions set forth”⁵² in the Treaty.

B. Non-Appropriation, Ownership and Due Regard

Article II of the Treaty states that “[o]uter space, including the moon and other celestial bodies, is not subject to national appropriation by claims of sovereignty, by means of use or occupation or by any other means.”⁵³ It is a principle so embedded in the bedrock of space exploration that it is considered by many to be not just a treaty obligation but customary international law.⁵⁴ It is this provision which renders the World Heritage Convention ineffectual off-Earth. Under the Convention, a State may only nominate a site within its territory for recognition as a World Heritage site. Conversely, the Outer Space Treaty specifically prohibits a claim of territory by any means.

and use by all States;” and “States shall facilitate and encourage international co-operation” in scientific investigation. Outer Space Treaty, *supra* note **Error! Bookmark not defined.**, at art. I. Article IV avers that “the Moon and other celestial bodies shall be used . . . exclusively for peaceful purposes.” *Id.* at art IV.

⁵¹ *Id.* art VI.

⁵² *Id.*

⁵³ *Id.* at art II.

⁵⁴ Fabio Tronchetti, *The Non-Appropriation Principle Under Attack: Using Article II of the Outer Space Treaty in Its Defence*, 50 PROC. L. OUTER SPACE 526, 530 (2007).

There is also internal conflict within the Outer Space Treaty itself. Pursuant to Article VIII of the Outer Space Treaty, objects left in space remain under the ownership and control of the nation that put them there.⁵⁵ Yet leaving the objects on site essentially results in perpetual occupation of the surface upon which they rest. This runs afoul of the principle of non-appropriation encapsulated in Article II.

Additionally, Article IX of the Outer Space Treaty requires all activities in outer space be conducted with “due regard” to other States,⁵⁶ which suggests that States should not interfere with or otherwise despoil the objects of another. Moreover, Article IX further requires that:

[i]f a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the Moon and other celestial bodies, would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space, including the Moon and other celestial bodies, it *shall* undertake appropriate international consultation before proceeding with any such activity or experiment.⁵⁷ (*emphasis added*).

Four other treaties related to sovereign space activities were negotiated in the wake of the Outer Space Treaty, colloquially known as the Rescue Agreement,⁵⁸ the Liability Convention,⁵⁹ the Registration Convention,⁶⁰ and the Moon Agreement.⁶¹ As their names suggest, these

⁵⁵ Outer Space Treaty, *supra* note 4, at art. VIII.

⁵⁶ *Id.* art. IX.

⁵⁷ Outer Space Treaty, *supra* note 4, at art. IX.

⁵⁸ Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, *adopted* Apr. 22, 1968, 672 U.N.T.S. 119 [hereinafter Rescue Agreement].

⁵⁹ Convention on International Liability for Damage Caused by Space Objects arts. II-III, *adopted* Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187 [hereinafter Liability Convention].

⁶⁰ Convention on Registration of Objects Launched into Outer Space art. I, *adopted* Jan. 14, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15 [hereinafter the Registration Convention].

⁶¹ Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, *adopted* Dec. 18, 1979, 1363 U.N.T.S. 3 [hereinafter Moon Agreement].

agreements respectively offer more detailed guidance on how States Parties should act in relation to the rescue of astronauts, responsibility and liability for damage caused by space objects, and the registration of objects launched, or intended to be launched, into orbit.⁶² The agreements provide no further guidance as to the relationship between Articles II, VIII and IX.

The Moon Agreement endeavors to provide further guidance regarding the exploration and use of celestial bodies by States and their citizens. However, to date, only eighteen nations have ratified the Agreement. None of China, the U.S., or Russia has done so. In April 2020, the U.S. president released an Executive Order which made clear both the U.S.'s unwillingness to enter into the Moon Agreement and its strategy to object to "any attempt to . . . to treat the Moon Agreement as reflecting or otherwise expressing customary international law."⁶³

Where does that leave cultural artifacts and operational equipment? Pursuant to Article VIII of the Outer Space Treaty, a State remains the owner of any object launched into space. There are already many of such objects on the Moon, and soon to be many more. What does it mean to show those objects "due regard?" Arguably, when approaching an object which is conducting scientific experiments or undertaking commercial activity, showing "due regard" would require maintaining a certain distance to assure the activity is not affected either directly or indirectly by another actor.⁶⁴

⁶²Agreement on the Rescue of Astronauts, *supra* note 59; Convention on International Liability for Damage Caused by Space Objects arts. II-III, *supra* note 60; Convention on Registration of Objects Launched into Outer Space art. I, *supra* note 61; Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, *supra* note 62.

⁶³ Exec. Order No. 13914, 85 Fed. Reg. 20, 381 (Apr. 6, 2020), <https://www.govinfo.gov/content/pkg/FR-2020-04-10/pdf/2020-07800.pdf>

⁶⁴ "Due regard means the regard that is appropriate in all the circumstances" *see* Definition of Due regard, LAW INSIDER (last accessed Dec. 26, 2020) <https://www.lawinsider.com/dictionary/due-regard>.

But what does due regard mean for non-operational objects? In the one extreme, they can be treated the same as operative objects and given wide-berth. But then, arguably, a State is violating Article II of the Outer Space Treaty by keeping its non-operational objects strewn about the Moon and thereby claiming territory by an “other means.” On the other extreme, because the objects are non-operational, it is not possible to do harm to them, so they may be removed from their resting areas and, ostensibly, returned to their owners. But, what if the object is a cultural artifact with unquestionable historic significance? Imagine if objects found at the Luna 2 site or the Apollo 11 site were removed by private entities. Even if they were returned to Russia and the U.S. respectively, scores of details that belong on the historical record would be irretrievably lost. Finally, what about the first bootprints ever left by humans on another celestial body? They enjoy no protection whatsoever under any law. We protect the evidence of our first bipedal footprints in Laetoli, Tanzania because they memorialize a human accomplishment, a turning point in our evolution. Archaeologists and anthropologists study those bare footprints to tease from them any knowledge they can about our common human history. Humanity’s first off-Earth footprints deserve the same respect and reverence. They mark another turning point in our evolution – our emergence as a spacefaring species. Even though the lunar landings were among the most-well-recorded events in human history, the true story of humanity’s first steps on the Moon can only be understood by studying the sites themselves. And the fact that these site are currently pristine, unmarred by weather or other human activity, makes them all the more precious.

Moreover, unlike the Laetoli prints, whose circumstances we are still trying to understand, the first bootprints on the Moon memorialize the work of hundreds of thousands of engineers, scientists and support staff who worked directly on the Apollo missions, not to

mention the thousands around the world throughout history who yearned themselves to reach our neighboring orb. Like the Laetoli prints, the bootprints remind humanity of where we came from, and inspire us to embrace our future.

C. Understanding Due Regard

As explained above, Article IX of the Outer Space Treaty imposes an obligation on States to conduct activities in space, including on the Moon, with “due regard to the corresponding interests of all other States Parties.”⁶⁵ This is a standard that remains undefined. Even so, it is also used in the United Nations Convention on the Law of the Sea, which states that freedom of the high seas “shall be exercised by all States with due regard for the interests of the other states in their exercise of the freedom of the high seas.”⁶⁶ An arbitral tribunal considered the meaning of “due regard” in 2015 and determined that:

the ordinary meaning of “due regard” calls for the [first State] to have such regard for the rights of [the second State] as is called for by the circumstances and by the nature of those rights. *The Tribunal declines to find in this formulation any universal rule of conduct.* The Convention does not impose a uniform obligation to avoid any impairment of [the second State’s] rights; nor does it uniformly permit the [first State] to proceed as it wishes, merely noting such rights. *Rather, the extent of the regard required by the Convention will depend upon the nature of the rights held by [the second State], their importance, the extent of the anticipated impairment, the nature and importance of the activities contemplated by the [first State], and the availability of alternative approaches.*⁶⁷ (emphasis added).

Under this interpretation, “due regard” requires a balancing test, taking into consideration the rights of the State that have been impinged by the contested activity, the extent of the impairment, the nature and importance of the contested activity, and the availability of

⁶⁵ Outer Space Treaty, *supra* note 4, at art. IX.

⁶⁶ United Nations Convention on the Law of the Sea art. 87(2), *adopted* Dec. 10, 1982, 3 U.N.T.S 1833 (1982).

⁶⁷ The Chagos Marine Protected Area Arbitration (Mauritius v. U.K.), Case No. 2011-03, Award, ¶ 519 (Perm. Ct. Arb. 2015).

alternative approaches. This balance will produce different outcomes on a case-by-case basis, an uncertainty that encourages States and their nationals to carefully consider their international obligations surrounding lunar activities.

D. Safety Zones

In addressing the uncertainty inherent in the Outer Space Treaty, nongovernmental organizations, lawyers and policymakers have suggested the implementation of so-called safety zones.⁶⁸ The Hague International Space Resources Governance Working Group,⁶⁹ (“Hague Working Group”) in particular, urges the implementation of an international framework that would

permit States and international organizations responsible for space resource activities to establish a safety zone, or other area based safety measure, around an area identified for a space resource activity as necessary to assure safety and to avoid any harmful interference with that space resource activity. Such safety measure shall not impede the free access, in accordance with international law, to any area of outer space by personnel, vehicles and equipment of another operator. In accordance with the area-based safety measure, a State or international organization may restrict access for a limited period of time, provided that timely public notice has been given setting out the reasons for such restriction.⁷⁰

The United States government also appears ready to endorse the concept of safety zones.

In disseminating “principles” to guide the execution of bilateral agreements regarding space

⁶⁸ NASA HQ, *The Artemis Accords: Repeating the Mistakes of the Age of Exploration* (last accessed Oct. 13, 2020) <http://spaceref.com/news/viewsr.html?pid=54175>

⁶⁹ “The Hague International Space Resources Governance Working Group was established in 2016 with the purpose to assess the need for a governance framework on space resources and to lay the groundwork for such framework.” International Institute of Air and Space Law, *The Hague International Space Resources Governance Working Group*, LEIDEN UNIVERSITY (last accessed Nov. 11, 2020), <https://www.universiteitleiden.nl/en/law/institute-of-public-law/institute-of-air-space-law/the-hague-space-resources-governance-working-group>. Members included “major stakeholders from government, industry, universities, civil society and research centers.” *Id.*

⁷⁰ The Hague International Space Resources Governance Working Group, *Building Blocks for the Development of an International Framework on Space Resource Activities*, LEIDEN UNIVERSITY (last accessed Nov. 11, 2020), <https://www.universiteitleiden.nl/binaries/content/assets/rechtsgeleerdheid/instituut-voor-publiekrecht/lucht--en-ruimterecht/space-resources/bb-thissrwwg--cover.pdf>.

activities, the U.S. indicated that “deconfliction of activities” is a key goal.⁷¹ To support this goal, the U.S.

and partner nations will provide public information regarding the location and general nature of operations which will inform the scale and scope of ‘Safety Zones.’ Notification and coordination between partner nations to respect such safety zones will prevent harmful interference, implementing Article IX of the Outer Space Treaty and reinforcing the principle of due regard.⁷²

There can be no doubt that safety zones are not only a good idea, but a necessity arguably mandated by the due regard provision of the Outer Space Treaty. However, there is no clear path to the implementation of such zones. The Hague Working Group urges the development of an international framework, a move, the international aspect of which is clearly supported by the Outer Space Institute and a multitude of “distinguished signatories” from around the world who “urge States to present for adoption at the United Nations General Assembly, a resolution which would request [the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS)] to negotiate, with all deliberate speed, a draft multilateral agreement on space resource exploration, exploitation and utilization for consideration by the General Assembly.”⁷³

⁷¹ *The Artemis Accords*, NASA (last accessed Sept. 7, 2020), <https://www.nasa.gov/specials/artemis-accords/index.html#:~:text=International%20space%20agencies%20that%20join,which%20facilitates%20exploratio n%2C%20science%2C%20and>

⁷² *See id.*

⁷³ Aaron Boley et. al., *Multilateral Agreement on Space Resource Utilization*, THE OUTER SPACE INSTITUTE (August 2020), <http://www.outerspaceinstitute.ca/docs/InternationalOpenLetterOnSpaceMining.pdf>. The Committee on the Peaceful Uses of Outer Space is largely accepted as the leading international forum to develop space law.

The Committee on the Peaceful Uses of Outer Space (COPUOS) was set up by the General Assembly in 1959 to govern the exploration and use of space for the benefit of all humanity: for peace, security and development. The Committee was tasked with reviewing international cooperation in peaceful uses of outer space, studying space-related activities that could be undertaken by the United Nations, encouraging space research programs, and studying legal problems arising from the exploration of outer space. The Committee was instrumental in the creation of the five treaties and five principles of outer space. International cooperation in space exploration and the use of space technology applications to meet global development goals are discussed in the Committee every year. Owing to rapid advances in space technology, the space

The U.S. is adopting a bilateral approach, which some argue is to force agreement with the safety zone concept, and its accompanying understanding that entities may stake a claim on the Moon, by dangling the opportunity “to join in America’s Moon mission.”⁷⁴

Underlying the differing approaches to implementation of safety zones is the U.S. disavowal of the concept that space is a global commons.⁷⁵ This sentiment was first captured in the Commercial Space Launch Competitiveness Act,⁷⁶ signed into law by President Obama, which recognizes commercial property rights in resources extracted from celestial bodies. The Trump Administration punctuated this statement with the 2020 issuance of an Executive Order which clearly states “the United States does not view [outer space] as a global commons,” but as a “legally and physically unique domain of human activity.”⁷⁷

Many scholarly articles have been written that explore the concept of a global commons.⁷⁸ Ultimately, the term has many connotations; but, like the concept of due regard itself, there is little certainty regarding its effect on space resource utilization activity.

agenda is constantly evolving. The Committee therefore provides a unique platform at the global level to monitor and discuss these developments.

Committee on the Peaceful Uses of Outer Space, UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS (2020), <https://www.unoosa.org/oosa/en/ourwork/copuos/index.html>.

⁷⁴ Robert Cochetti, *Who Can Own the Moon*, THE HILL (June 24, 2020), <https://thehill.com/opinion/technology/504289-who-can-own-the-moon>

⁷⁵ For more on the subject of space as a global common, see Iris Kyriazi, *Outer space as global commons* (May 25, 2020) <https://katoikos.world/analysis/outer-space-as-global-commons.html>

⁷⁶ U.S. Commercial Space Launch Competitiveness Act, H.R. 2262, 114th Cong. (2015).

⁷⁷ Exec. Order No. 13914, 85 Fed. Reg. 70 (Apr. 10, 2020).

⁷⁸ For an excellent review of the concept, see Henry R. Hertzfeld, Brian Weeden & Christopher D. Johnson, *How Simple Terms Mislead Us: The Pitfalls of Thinking about Outer Space as a Commons*, 58 PROC. INT’L INST. SPACE L. 533 (2015).

Implementing a safety zone regime in space would remove many of the uncertainties in the Outer Space Treaty and eliminate the guesswork in the balancing act presupposed by the concept of due regard. However, a bilateral approach, like the U.S.'s, feels exclusive, and will leave many sites – both operable and heritage – vulnerable if it fails to garner widespread adoption. Similarly, an international effort to address these important issues through the UNCOPUOS will undoubtedly take many years, if not decades to reach conclusion.⁷⁹

IV. A New Approach

A. History at Risk

Arguably, we have some time before actual mining operations begin on the Moon or any other celestial body, but the concept of due regard for objects already on the lunar surface needs to be addressed more promptly. Cultural artifacts on the Moon are vulnerable to any lunar activity. Indeed, the National Aeronautics and Space Administration (NASA) recognized this in 2010 when it organized a team solely to address questions regarding the protection of historic sites on the Moon. The team developed and released its report “NASA’s Recommendations to Space-Faring Entities: How to Protect and Preserve the Historic and Scientific Value of U.S. Government Lunar Artifacts” (“NASA Guidelines”) in July 2011.⁸⁰ The NASA Guidelines recommend the implementation of a two kilometer “exclusion radius” around significant lunar heritage sites. Per the Guidelines, no vehicle should overfly or attempt to land on the Moon

⁷⁹ It took nine years for delegates to the United Nations Committee on the Peaceful Uses of Outer Space to agree to twenty-one nonbinding guidelines supporting the long-term sustainability of outer space activities and the delegates have yet to agree on even the definition and delimitation of outer space – after decades of consideration.

⁸⁰ NASA’s Recommendations to Space-Faring Entities: How to Protect and Preserve the Historic and Scientific Value of U.S. Government Lunar Artifacts 12, NASA (Jul. 2011), https://www.nasa.gov/sites/default/files/617743main_NASAUSG_LUNAR_HISTORIC_SITES_RevA-508.pdf [hereinafter NASA Guidelines]. *see also* Peter Martinez, *UN COPUOS Guidelines for the Long-Term Sustainability of Outer Space Activities: Early implementation experiences and next steps in COPUOS*, (Oct. 2020) https://swfound.org/media/207080/iac2020_e341_Its_guidelines_early_implementation_experiences.pdf.

within a two-kilometer radius of any so-called U.S. government heritage lander, defined to include the Apollo and Surveyor lunar landing sites.⁸¹ The distance was chosen primarily to alleviate the destructive potential of the regolith ejecta effect in the lunar environment.⁸²

Essentially, any activity that will stir the lunar surface, whether a rover or a lander, will cause the very abrasive regolith to impact any hardware within a certain radius with the potential of causing severe damage.⁸³ These Guidelines, which are not binding or enforceable, even against U.S. nationals,⁸⁴ highlight the vulnerability of cultural heritage on the Moon, especially in the face of increased activity.

B. So, Put History First

Clearly, it has proven difficult for the international community to agree on space governance matters. However, the nations of the world have proved unanimous support of the protection of human heritage. And there is no heritage more universal than lunar landing sites on the Moon, which these sites represent a milestone in human evolution, the development as well as the culmination of the work of humans throughout the world and throughout history. The human relationship to space is necessarily global and universal. “The famous Earthrise image,

⁸¹ *See id.* at 7.

⁸² *See* Michelle L.D. Hanlon & Bailey Cunningham, *The Plume Effect: An “Aggravation and Frustration” That Imperils Our History and Our Future*, 43 J. SPACE LAW 309 (2019).

Research indicates that upon approach and landing, lunar lander engine exhaust will blow, rocks, soil and dust at high velocities. This lander ejecta can severely damage hardware even tens of kilometers away from the landing site. Building berms or using terrain obscuration to obstruct or curtail the ejecta each offer only partial solutions to this potentially mission-ending issue because large landers can send ejecta into high trajectories that cannot be successfully blocked. Indeed, it has been shown that it is even possible for ejecta to damage or destroy spacecraft orbiting the Moon.

Id. at 309.

⁸³ *Id.* at 312-313.

⁸⁴ The One Small Step to Protect Human Heritage in Space Act would require entities licensed by the United States to comply with NASA’s Guidelines. One Small Step Act, S. 1694, 116th Cong. (2019). The Act passed the U.S. Senate unanimously in 2019 but has yet to be considered by the U.S. House of Representatives.

taken by astronaut William Anders in 1968 during the Apollo 8 mission, was perhaps the most influential environmental photo ever, and has taught us humility as we understand our very precious space in our solar system.”⁸⁵ More than 600 million people “tuned in to watch or listen to the Apollo 11 lunar landing.”⁸⁶ Few would argue that the site where humans first set foot on another celestial body should be recognized and protected less than any site on Earth.

With this in mind, rather than embark upon the development of an entirely new legal regime to govern space resource utilization and flesh out the specifics of due regard, the international community, though UNCOPUOS, should initiate the important process by reaching agreement on how to protect humanity’s greatest treasures in space. Starting with humanity’s firsts on the Moon, like Luna 2, the first hard landing, Luna 9, the first soft landing, Apollo 11, the first crewed landing, the international community can consider each level of deference each object and site deserve. UNCOPUOS should then solicit expert testimony from geologists and engineers who can describe the effects and trajectory of the plume effect. From there, they can establish safety zones barring access to any of these sites, until humans have the technology to approach them without destroying them. Given the strong ownership structure of Article VIII of the Outer Space Treaty, any approach must be with the approval of the State that retains the ownership of the objects. These parameters will serve as the baseline, the most severe and rigorous protections any site on the Moon can enjoy. It is an ideal starting point to: first, make the international community comfortable with the concept of safety zones; and second, build the

⁸⁵ M. Ann Garrison Darrin, *The Impact of the Space Environment on Material Remains*, in *ARCHAEOLOGY AND HERITAGE OF THE HUMAN MOVEMENT INTO SPACE* 13, 27 (Beth Laura O’Leary & P.J. Capelotti, eds., 2015).

⁸⁶ J. Reynolds, *Legal Implications of Protecting Historic Sites in Space*, in *ARCHAEOLOGY AND HERITAGE OF THE HUMAN MOVEMENT INTO SPACE* 13, 27 (Beth Laura O’Leary & P.J. Capelotti, eds., 2015).

scientific understanding and knowledge necessary to combat both foreseen (intentional intrusion) and unforeseen (plume effect) hazards to objects on the Moon.

Beyond these three firsts on the Moon, there will, no doubt, be required debate over the status of other sites and objects. But, these can be addressed in a manner similar to the process adopted by the World Heritage Convention. As a matter of first instance, UNCOPUOS must agree to a definitive list and location of all the sites and objects on the Moon. A digital catalog of these items is maintained by the nongovernmental organization For All Moonkind, and would be an excellent starting point.⁸⁷ Once affirmed, sites and objects should be categorized. The two extreme categories would be: first, debris or trash, available for inspection, and even recycling and reuse upon negotiation with the State which is the owner of the object; and second, cultural heritage of universal value. The UNCOPUOS may initiate a nomination process and invite States to nominate their object and the sites upon which they sit for consideration of universal value.

Subsequent categories may include an identification of operative equipment used for scientific purposes and operative equipment used for commercial purposes. Finally, the UNCOPUOS will need also to consider commercial property that has no purpose. For example, companies like Astrobotic are offering to take private objects to rest on the Moon as part of their trademarked DHL Moonbox kit,⁸⁸ and Celestis⁸⁹ promises to take human remains to the lunar surface. What should “due regard” entail for these items? Viewing all of these sites from the prism of history will provide new perspective on these important matters.

⁸⁷ *Moon Registry*, FOR ALL MOONKIND (last accessed Nov. 11, 2020), <https://moonregistry.forallmoonkind.org/>

⁸⁸ *Immortalize Your Keepsake on the Moon*, ASTROBOTIC (last accessed Nov. 11, 2020), <https://www.astrobotic.com/moon-box>

⁸⁹ CELESTIS (last accessed Nov. 11, 2020), <https://www.celestis.com/>.

A final benefit of approaching the task of implementing due regard through the establishment of a safety zone regime is that the entire process will be accomplished from a baseline of conservation rather than exploitation. As we have learned on Earth, development need not be halted by preservation efforts; however, humans have been given a unique gift in the 50-year gap between crewed visits to the Moon. The site of one of our own momentous evolutionary accomplishments sits pristine, waiting for our return. We will never know where our ancestors took their first bipedal footsteps, where we first harnessed fire, or where we made our first tools. But, we do know where exactly our first human-made object impacted the Moon, and where our first off-world footsteps were taken. These sites will forever hold the remnants of our birth as a spacefaring community, the cradle of our spacefaring species.

V. Conclusion

It is appealing to consider this our generation's Nubia moment, which the author has done in the past.⁹⁰ Like Nubia, the cradle of our spacefaring future is threatened by the need for development, here, the development of space resource utilization, specifically on the Moon. However, unlike Nubia, saving our history on the Moon will not cost \$80 million, nor will it require moving shrines and temples. It simply requires formalizing and verbalizing a tacit understanding that there are sites on the Moon that deserve recognition and protection for their universal value to humanity.

This builds on the concept of heritage protection awakened by Nubia and takes it to new heights, both literally and figuratively. As we embark on the next stage of our evolutionary development, we have the unique opportunity to manage that development with care we never

⁹⁰Michelle Hanlon, *Our Nubia Moment*, SPACEWATCH.GLOBAL, (last accessed Nov. 11, 2020), <https://spacewatch.global/2018/02/spacewatchglthemes-space-archaeology-nubia-moment-michelle-hanlon/>.

considered in the past. And of even more importance to the commercial space industry, opening discussion from a place of agreement – preservation of heritage – will speed the process needed to address the uncertainty inherent in the balancing proposition required by the concept of due regard. Not to mention the fact that it will help to preserve for generations to come the sites that create a seemingly bottomless well of inspiration for space entrepreneurs and dreamers.

Finally, recognizing heritage outside the norm of sovereign territory will provide one final unique and matchless gift: the chance to recognize incredible technological achievements not as national triumphs, but human triumphs. As Neil Armstrong descended the ladder of the lunar module at Tranquility Base, and planted his boot in the regolith, he completed a journey that started with a human who decided to stand up on two feet. A new journey is starting for humanity, one that is truly without boundaries, one that should be explored outside the confines of our Earthly sovereign paradigms.